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An Intensive Archaeological Survey of the Vogtle-SRP 230KV Transmission Line, Savannah River Plant, Barnwell County, South Carolina

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AN INTENSIVE ARCHAEOLOGICAL SURVEY OF THE VOGTLE-SRP 230KV TRANSMISSION LINE, SAVANNAH RIVER PLANT, BARNWELL COUNTY, SOUTH CAROLINA

by

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Chapter I

Introduction

The intensive archaeological survey and testing of the 17 mile Vogtle - SRP 230kv transmission line within the boundaries of the Savannah River Plant was conducted by the South Carolina Institute of Archaeology and Anthropology under the supervision of Glen T. Hanson. The purpose of this field study was the identification and evaluation of significant archaeological and historical sites within the 100 foot wide transmission line corridor. Background research consisted of a review of all archaeological sites known to exist in the vicinity of the proposed right-of-way using the computer based archaeological data management system at the Savannah River Plant Archaeological Research Program laboratory. No sites presently on the National Register of Historic Places occur within the study area.

Fieldwork consisted of intensive examination of the entire right-of-way by two-three person crews using a combination of surface inspection and subsurface techniques to discover previously unrecorded sites. No archaeological sites that had not been already recorded by the Savannah River Plant Archaeological Research Program were discovered within the right-of-way. Five archaeological sites (38BR35, 38BR104, 38BR190, 38BR205 and 38BR333) were situated within the parameters of the corridor. Two sites (38BR35 and 38BR104) are recommended as having sufficient research potential and scientific significance to warrant eligibility for nomination to the National Register of Historic Places. The remaining three sites either lacked sufficient content and/or integrity of deposits to be considered significant and eligible for the National Register of Historic Places.

This report documents all theoretical, methodological and technical aspects of the research associated with the study. It further presents the archaeological and locational information for the sites which permit independent review of the findings. Overall, the archaeological resources presented in reference to current archaeological issues regarding the prehistoric and historic occupations of the region as a means of evaluating the potential of the sites and the information contained within them for yielding significant new information and understanding.

Potential effects on the archaeological resources by the construction of transmission lines and the use of the corridor for access road right-of-ways are discussed. Specific recommendations relating to the proposed transmission corridor are presented which address the problem of erosion and direct impact by equipment. It is recommended that the corridor be cleared without the use of heavy equipment in the vicinity of 38BR35 and 38BR104, while limited data recovery and/or avoidance of portions of 38BR35 and 38BR104 is recommended to mitigate adverse effect.

Chapter II

ARCHAEOLOGICAL BACKGROUND

The Prehistoric Occupation of the Savannah River Valley

Within the drainage of the Savannah River below the Fall Line, investigations of cultural heritage from an archaeological perspective have been focused on selected areas. For this reason, an overview of the prehistory of the area must rely on information selectively investigated without regard for general archaeological pattern. This general discussion of the occupational history within the study area and immediate environs will be an attempt to characterize the general prehistory of the Savannah River drainage within the Coastal Plain (Table 1).

Archaeological undertakings of a controlled nature were begun in the latter half of the last century by Thomas (1894) and Moore (1899) in their studies on prehistoric mound sites within river valleys of the eastern United States. Their efforts resulted in the location of and collection from selected large sites within the Savannah River area. Although these pioneer studies were of value only in documenting the presence of sites within the drainage, these were the preliminary efforts in the study of the region's archaeological resources.

Increasingly scientific archaeological research within the area began with the efforts of William Claflin in the vicinity of the Fall Line at Stalling's Island. Claflin excavated a large shellmound, the Stalling's Island Site, on an island within the Savannah River during the 1920s and documented an assemblage of the earliest ceramic complex in the eastern United States (Claflin 1931; Sears and Griffin 1950; Bullen and Green 1970). For this reason, the Stalling's Island Site has become one of the most important cultural resources known in the Southeast and has been subjected to intermittent investigations since Claflin's first study (Fairbanks 1942; Sears and Griffin 1950; Bullen and Green 1970).

In the delta region of the Savannah River, Antonio Waring was instrumental in the initial understanding of the prehistoric archaeological record. During his brief life, Waring, in cooperation with various archaeologists, recorded, collected and/or excavated many of the key archaeological sites that would form the foundation of future archaeological research in the Savannah River area. Waring and others were responsible for the description of the basic ceramic types and general ceramic complexes such as the Deptford ceramic complex (Waring and Holder 1968), Woodland and Mississippian ceramic types (Caldwell and Waring 1939), and Early Woodland ceramic types and assemblages (Williams 1968: 152-215). The summary of Waring's work provided by Williams (1968) stands as a major contribution to the study of Savannah River prehistory.

Other research in the Savannah River area was conducted during the W.P.A. period on the Irene Mound Site, a Mississippian Period site. Conducted over the course of several years, the excavations revealed the existence of a long-term occupation associated with a ceremonial center (Caldwell and McCann 1941). The excavations yielded the first comprehensive plan of such a ceremonial complex within the Atlantic Coastal area and extended the known archaeological record into protohistoric times.

Subsequent research was delayed for almost two decades, until the 1960s when renewed interest in the initial ceramic period prompted the work of James Stoltman at Groton Plantation (Stoltman 1974). This research project involved the survey and test excavation

of sites within the plantation for purposes of exploring the development of Late Archaic and Woodland cultures in the riverine area of the Coastal Plain. The major outcome of this research was the excavation of two sand mounts, Rabbit Mount and Clear Mount. These contained shell middens associated with some of the earliest known ceramics in North America. In addition, sites representative of Archaic, Woodland and Mississippian occupations were located in the survey, and the distribution of these sites suggested to Stoltman (1974: 229-244) radical differences in subsistence and settlement practices at various times.

Following Stoltman's research, Drexel Peterson (1971) intensified the survey of the Groton Plantation area in order to refine specific hypotheses regarding ceramic chronology and cultural development. The general result of the study was the discovery that changes in subsistence strategies were not appreciable during the Woodland period, as was thought by Stoltman (1974). Another result was a ceramic chronology that included several additional "phases" during the Early Woodland period and later times. These latter results have yet to be substantiated from other research in the general area.

Concomitant with the latter research was the expansion of study in other areas of the Savannah drainage. This research included survey and excavation at White's Mound (Phelps and Burgess 1964; Phelps 1968), Hollywood Mound (DeBaillou 1965), the Theriault site (Brockington 1971), Mississippian sites along the Savannah River, the Augusta area (Ferguson and Widmer 1976), and work at Stalling's Island (Bullen and Green 1970). Thomas et al. (1978) provided an updated chronology for the Late Archaic of the lower Savannah River Valley through their work at St. Catherine's Island.

Works by DePratter (1976, 1977) refined the chronology of the Early Woodland in the Savannah River Valley and Georgia coast, and suggested changes in the subsistence and settlement patterns that occurred within this region during this period. Trinkley (1980) made similar contributions toward our understanding of the settlement changes and chronology of the Woodlands period of the coast and Coastal Plains of South Carolina.

Other works from outside of the Savannah River Valley have increased our knowledge of the interior Coastal Plain of South Carolina. Trinkley (1974) reported the findings of the Albert Love site. This is one of the few Upland Late Archaic sites excavated in the Upper Coastal Plain. Excavations at four sites tested for the Southeastern Columbia Beltway Project (Anderson 1979) and at the Cal Smoak site (Anderson, Lee and Parler 1979) provided data useful in formulating prehistoric chronologies for the Upper Coastal Plain of South Carolina. Brooks (1980) provided both survey and excavated data to suggest settlement/subsistence patterns for the lower interior Coastal Plain. Larson (1980) also suggested patterns of late prehistoric subsistence within the interior Coastal Plain. The combined results of these research efforts form the basis for the present understanding of prehistoric development within the Savannah River Valley below the Fall Line. Although a synthetic overview of the prehistory of the area is yet to be written, the initial foundation exists for a general chronological framework (Table 1).

Paleo-Indian (10500 - 9500 B.C.)

The Paleo-Indian period of the eastern United States is largely recognizable by the presence of the fluted Clovis (or Clovis-like) points and, in the Southeast, by unfluted lanceolate points such as the Quad and Suwanee types. Radiocarbon dates from the Delbert site in Nova Scotia and the Shawnee-Minisink site on the Delaware River of Pennsylvania

average 8600 B.C. for fluted point forms. Dates from west of the Mississippi suggest earlier occupations for that area beginning at ca. 9500 B.C. (Wormington 1957).

The subsistence resources exploited by Paleo-Indian populations of the eastern United States are poorly known. Little subsistence data have been recovered from Paleo-Indian sites east of the Mississippi River. Because of the lack of data, the earliest reconstructions of the subsistence patterns of this period were based upon faunal information borrowed from sites located on the Western Plains. Based on similarities in projectile points and overall similarities in tool assemblages, it is generally assumed that most Paleo-Indians of North America were similarly adapted to a system focusing on the exploitation of now-extinct, large herbivores (Mason 1962: 243).

Recent data from the eastern United States have resulted in questions being raised about the role that the hunting of the megafauna played in the subsistence strategies of these people. Food remains from Meadowcroft Rockshelter in Pennsylvania included white-tailed deer (Odocoileus virginianus), elk (Cervus canadensis), nuts, and chenopod seeds (Adovasio et al. 1977: 154). Shawnee-Minisink in Pennsylvania produced hawthorn pits and fish remains (McNett, McMillian, and Marshall 1977). These sites suggest that resources other than megafauna may have played a very important role in the Paleo-Indian diet.

In the Southeast, studies by Williams and Stoltman (1965) and Michie (1977) suggest a strong geological correlation between the several forms of Paleo-Indian projectile points and the margins of rivers that are often the locations of mastodon fossil recovery. Bullen, Webb, and Waller (1970) also produced evidence of a mastodon vertebra that was apparently cut while the bone was green. These studies suggest that areas suitable for megafauna such as wide river margins may be closely correlated with Paleo-Indian site locations in the Southeast.

Settlement data for the Paleo-Indian period occupation for the Savannah River Plant are rare. Prior to this survey, only two fluted points have been recovered within the plant boundaries.

Evidence for Paleo-Indian occupation has, however, been recovered from the Coastal Plain of South Carolina (Michie 1977) and from the Theriault Site (Brockington 1971). Although complete assemblages have yet to be found in association with the diagnostic fluted points typical of all of the above localities, the presence of the points would suggest some activity within the region during the latter portions of the Pleistocene.

Michie's 1977 study suggests a general model for the location of Paleo-Indian sites within the Coastal Plain based on the distribution of fluted points. He concludes that:

> The overall pattern of projectile point distribution seems to involve the larger river systems (of South Carolina) such as the Broad, Savannah, Wateree, Pee Dee, Congaree, and the smaller Edisto Rivers. When these rivers are involved with point distributions and location, the points usually occur at the intersection of creeks and the highest portion of land near that intersection (Michie 1977: 92).

Due to geological conditions following this Pleistocene adaptation, the recognition of Paleo-Indian sites is difficult. Holocene changes in stream hydrology have resulted in the deposition of recent sediments on many locations believed to be favored by these early hunter-gatherers (Michie 1977). These changes may in part account for the scarcity of Paleo-Indian remains at the Savannah River Plant. Given Michie's data, sites may

occur at the confluences of major tributaries (Upper Three Runs, Four Mile, Pen Branch, Steel and Lower Three Runs), but their presence is probably obscured by alluvial sediments of great depths.

The two points discovered on plant property were found at locations that do not fit Michie's model. One was discovered on Lower Three Runs 15 miles from the Savannah River. The other point was discovered in the xeric sandhills far from any large stream. Both discoveries suggest that a much more complicated settlement pattern exists for the Upper Coastal Plain than that potential by Michie.

Early Archaic (9500 - 7500 B.C.)

Archaeological evidence of the earliest Holocene hunter-gatherers is composed of the presence of the Dalton-Hardaway phase (Goodyear 1974; Coe 1964) throughout the Eastern United States. During this period, lanceolate, indented-base Dalton points are gradually replaced by small indented-base, side-notched forms (Hardaway side-notched). Coe (1964: 64, 81) suggests these points to be roughly contemporaneous. The Hardaway side-notched points are rare in most parts of South Carolina (Goodyear 1978: 79) and do not seem to be present on the Savannah River Plant.

Radiocarbon dates for the Dalton phase range between 8480 and 6920 B.C. Lower layers of Graham Cave in Missouri containing Dalton points cluster between 7700 and 7000 B.C. (Crane and Griffin 1968). Standfield Worley Bluff Shelter in northern Alabama contained layers producing both Daltons and side-notched points that were dated at 6920 and 7640 B.C. Rogers Shelter in Tennessee produced dates of 8,350±330 and 8,480±650 B.C. (Griffin 1974: 94).

Associated with this temporal phase and with Paleo-Indian and later Early Archaic phases is a variety of unifacial blade and flake tools intentionally retouched for the tasks of scrapping, cutting, and graving (Goodyear, House, and Ackerly 1979: 97). Unique to the Dalton-Hardaway phase of Arkansas, and, perhaps, South Carolina, is the presence of bifacial adzes (Morse and Goodyear 1973; Goodyear, House and Ackerly 1979: 96).

Following the Dalton-Hardaway phase, the latter portion of the Early Archaic is represented by a series of corner- and side-notched projectile points. These include the Taylor, Palmer, and Kirk points (the Kirk point is considered here as transitional between the Early and Middle Archaic periods). Taylor points are known throughout the Coastal Plain of South Carolina, and Palmer and Kirk points have been recorded throughout South Carolina and adjoining states within the Coastal Plain and Piedmont physiographic province.

Limited stratigraphic evidence from the Theriault site on Brier Creek in Georgia suggests that Taylor points underlie Palmer points (Brockington 1971). Materials recovered from the nearby Cal Smoak Site in the Edisto drainage (Lee and Parler 1972; Anderson, Lee, and Parler 1979) suggest a clear priority of Palmer occupations to Kirk and Middle Archaic forms.

The Early Archaic represents the initial response of prehistoric inhabitants of the Coastal Plain, and North America in general, to the ameliorating climatic conditions of the Holocene. The changes in climate and associated vegetational patterns and faunal populations during the immediate post-Pleistocene provided a much more suitable environment for human population growth. Hunting and gathering resources were more plentiful due to this change from a cooler climate to a milder climate with increases

in deciduous nut and seed-bearing vegetation. Although variation occurred in this Holocene climate sequence, the present-day character of the Coastal Plain was beginning to develop at this time.

Floral and faunal remains associated with Dalton sites of the Southeast and Midwest include white-tailed deer, turkeys, cotton-tail rabbits, squirrels, raccoons, fishes, mussels, and wildfowl (McMillian 1972).

Locational studies of Dalton sites have been done in several parts of the South. The locations of Dalton-Hardaway associations in the Coastal Plain of Georgia have been examined by Fish (1976: 22-23), who suggests a strong association between large stream systems and these Early Archaic types. Dalton period occupations in Arkansas, however, are spread both along and between the large stream systems, suggesting the first intensive human occupation of the inter-riverine areas of the southeastern United States (Morse 1973; Goodyear, House and Ackerly 1979: 98).

Cal Smoak and other Palmer components from the Fall Line and Coastal Plain (Michie 1971; Coe 1964) suggest strong associations with large stream systems, although in the Piedmont, House and Ballenger (1976) and Goodyear (1978) indicate an extensive upland, ridgetop association for small Palmer components. These results may indicate a widespread occupation and diffuse land use pattern related to a broad spectrum subsistence base during the latter portions of the Early Archaic. This and any other inference for the period within South Carolina, however, must await evaluation through excavation and more intensive analysis.

To characterize the Early Archaic period, it must be mentioned that the evidence is minimal, at best, for the Coastal Plain. Dalton-Hardaway and Palmer occupations are surely present based on the common occurrence of projectile points, but associated assemblages are as yet poorly understood. Distributional studies (Goodyear 1978; Goodyear, Ackerly and House 1979) indicate a wide-ranging land use pattern, which is suggested to relate to the exploitation of deer in the uplands and riverine resources in major drainages of the Piedmont. The general survey of the Savannah River Plant located 10 Early Archaic components, 3 Dalton and 7 Palmer, in geographical contexts ranging from high uplands to the river terraces of the Savannah (Hanson, Most and Anderson 1978).

Middle Archaic (7500 - 3000 B.C.)

This period is characterized by a continuance of a generalized hunting and gathering pattern with changes in projectile point morphology. Four projectile point forms are typical of this period: Kirk, Stanley, Morrow Mountain, and Guilford.

The Kirk includes a variety of corner-notched point types that differ largely from the Palmer in that the Kirk lacks both basal grinding and straight based, serrated forms (Coe 1964). Radiocarbon 14 dates cluster between 7500 and 7000 B.C. Dates from sites in the Little Tennessee Valley include figures of 7,485±270 B.C., 7,400±215 B.C., and 7,225±240 B.C. from Icehouse Bottom; 7,460±290 B.C. from the Patrick site; and 7,160±140 B.C. and 7,380±250 B.C. from Rose Island (Chapman 1977: 161-162). Other dates, 6,430±130 B.C. from the Six Toe site in northern Georgia, and 6,570±300 B.C. and 7,900±500 B.C. from the St. Albans site in West Virginia, have been recorded for Kirk corner- and side-notched forms (Broyles 1971).

Kirk tool kits differ from earlier assemblages by the occasional appearance of grinding tools. Two metates were reported from Russell Cave in northern Alabama (Griffin 1974:

2). Whether these tools represent an intensification of nut resources or the first intensive use of small seeds is unclear (Goodyear, House, and Ackerly 1979: 103), but their presence suggests an increased exploitation of vegetation from earlier periods. Overall, Kirk corner-notched assemblages represent transitional Early Archaic/Middle Archaic adjustments to a changing environment.

The Kirk forms are succeeded by indented based, stemmed Stanly points. These are radiocarbon-dated at 5,840+215 B.C. at Icehouse Bottom (Chapman 1977). Changes in tool kits are represented by the disappearance of the well-made "tear drop" endscrapers found in earlier assemblages and the first appearance of ground stone tools represented by semi-lunate atlatl weights (Coe 1964: Table 2; Chapman 1977).

The Middle Archaic concludes with the presence of Morrow Mountain and Guilford point types. The Morrow Mountain points consist of slightly shouldered points with slightly tapering stems and round bases. Little is known about associated assemblages. Burial goods from the Stanfield-Worley Rockshelter in northern Alabama suggest the presence of crude unifacial side- and endscrapers (DeJarnette et al. 1962: 83). Chapman (1977: 106) reports the presence of drills and scrapers in the Little Tennessee Valley. A hearth with associated projectile points from site 38LX5 at the Fall Line of South Carolina dates the Morrow Mountain phase to 3,520+170 B.C. (Anderson 1797: 90). Other dates from Alabama and Tennessee range from 4750 to 4030 B.C. (Chapman 1976: 8).

The Guilford point can be described as a leaf shaped or lanceolate point with an excurvate or incurvate base (Coe 1964). Stratigraphic evidence in the North Carolina Piedmont suggests 4000 B.C. as the probable beginning for the Guilford phase. Coe (1964: 51) suggests that this phase differs from the preceding Morrow Mountain by the appearance of notched, chipped axes and, perhaps, the disappearance of unifacial tools.

The common distribution and density of these point forms throughout the Coastal Plain and Piedmont would suggest a greater population and extensive pattern of land use. With the exception of Lake Spring (Miller 1949), Theriault (Brockington 1971) and Cal Smoak (Lee and Parler 1972; Anderson, Lee and Parler 1979) sites, a few sites in the area of the Savannah River Plant have been excavated and have produced evidence of the Middle Archaic. Little is known of the Middle Archaic assemblage for the Coastal Plain region aside from the ubiquitous hafted bifaces (projectile points).

The Middle Archaic components, 8 Kirk and 2 Stanly-Morrow Mountain, were recorded during the general reconnaissance of the Savannah River Plant (Hanson, Most and Anderson 1978). As in the case of the Early Archaic sites, these were distributed in all major environments.

Late Archaic (3000 - 1000 B.C.)

Within the prehistoric sequence of the Savannah River Valley, the Late Archaic is perhaps the best examined cultural period stressing its importance in understanding the initial development in ceramic technology.

The most noticeable change in tool assemblages from those of the Middle Archaic is the addition of fiber-tempered pottery. Radiocarbon dates from White and Rabbit Mounts suggest that these are the earliest ceramic sites in North America (Stoltman 1972, 1974). Data representing this period have been excavated from 24 sites along the Savannah River from the lower Piedmont to the Atlantic Ocean. These sites are discussed by Stoltman (1972) in great detail, especially with reference to the presence of

fiber-tempered pottery. Among the more important of these sites, because of the availability of radiocarbon dates, are Stalling's Island (Claflin 1931; Fairbanks 1942; Bullen and Green 1970), White's Mound (Phelps and Burgess 1964), Rabbit Mount (Stoltman 1974), Bilbo (Williams 1968: 152-197), Dulany (Williams 1968), and Sapelo Island (Williams 1968). Other sites include Refuge (Williams 1968: 198-208), Lake Spring (Miller 1949), Chester Field (Williams 1968: 208), Daws Island (Hemmings 1972), Walthour (Caldwell 1952: 314), Meldrim (Williams 1968: 182-183), and Oemler (Williams 1968: 182-183).

At several of these sites, both ceramic and pre-ceramic occupations are recognizable. The presence of fiber-tempered ceramics at sites of the Late Archaic is restricted to what Stoltman (1974: 19) refers to as the Stallings II and Stallings III phases. Basically, these two phases are distinguished from each other by the presence of only plain fiber-tempered ware in the Stallings II Phase as opposed to the occurrence of decorated ware in the Stallings III Phase. Dates of 2,750±150 B.C. and 2,500±150 B.C. at Stallings Island were derived from the pre-ceramic occupations (Stallings I). Charcoal from a pit at the bottom of the ceramic horizon of that site dates the beginning of Stallings II at 1,780±150 B.C. Earlier dates of ca. 2500 B.C. have been recorded at the Rabbit Mount Site (Stoltman 1972).

Associated with these sites is a variable lithic industry best represented at Stalling's Island, Rabbit Mount, Bilbo, and Lake Spring (Stoltman 1972: 45). The raw materials range from slate to chert depending on the local availability of these materials. Savannah River points dominate the assemblage with numerous unifacial tools, grinding tools, cruciform drills, large nonhafted bifaces, steatite "netsinkers," chipped adzes, bannerstones, ground axes, and steatite bowls (Stoltman 1972: 46-47). This diverse assemblage of tool types is complemented by various antler, bone and shell tools found at Rabbit Mount and Stalling's Island (Stoltman 1972).

Stallings I has basically the same assemblage as the other two phases except that it lacks ceramics. Some changes in projectile point morphology are recognizable between the pre-ceramic and ceramic phases. The large, broad-stemmed points of the pre-ceramic are replaced by smaller, more contracting-stemmed forms in Stallings II (Bullen and Green 1970: 13; Keel 1976). These later points are called Otarre points (Keel 1976).

Stoltman (1972, 1974) has synthesized the most recent information available on the Late Archaic in the Savannah drainage and has suggested a riverine adaptation focused on shellfish with some upland occupation and numerous features and diverse tool assemblages are present at some large riverine sites, indicating relatively sedentary human populations (Hanson 1981: 8).

Based on the distribution of sites for the Late Archaic, there does not appear to be a major distinction in settlement patterns between the three phases; indeed, the phases may be simply taxonomic distinctions based on ceramics without any relevance to settlement or subsistence patterns. As in the other Archaic periods, sites tend to focus on large drainages and are often found within the floodplains of rivers on alluvial rises or mounts. Shellfish were heavily utilized as were mammalian fauna (Stoltman 1974). Excavation of sites has focused on the large shell-bearing locations that may be large riverine base camps, but little information is available for upland Late Archaic sites.

The known Late Archaic occupation of the Savannah River Plant is represented at 10 sites, the majority (6 sites) of which are situated on floodplains and terraces (Hanson, Most and Anderson 1978: 121-122). These sites are generally large and high in artifact content. On the other hand, the four upland sites contain relatively fewer artifacts and tend to be smaller than the terrace-floodplain sites.

Early Woodland (1000 B.C. to A.D. 1)

The Woodland Period has been defined by Willey (1966) as a general period during which ceramics, burial mounds and agriculture were common; however, this definition is based primarily on artifactual traits, the most common of which is ceramics. As mentioned in the description of the Late Archaic, ceramics are known from the Savannah River area well before the 1000 B.C. date given here. Stoltman (1974: 20-21) simply states that the Early Woodland is defined on the basis of sand-tempered ceramics for the region in the absence of definitive proof of mounds or agriculture. For this reason, the use of the term Woodland is useful only as an heuristic device for relative chronological purposes. The discussion of the various Woodland phases that follows will provide a general understanding of the variation in ceramic style and settlement patterns associated with the ceramic time indices.

Determination of the exact starting dates for the Early Woodland period in the Coastal Plains has been confused by similarities between many of the fiber-tempered and sand-tempered wares. The major problem arises with Thom's Creek/Awendaw types, which are sand-tempered, punctate design types similar to the fiber-tempered Stallings III ceramics. Other designs common on these ceramics are simple stamping and incising (Phelps 1968). South (1973) has grouped these Thom's Creek ceramics and those of the later Refuge complex into a Formative ware group association with those of the Stallings II and III phases. This latter grouping may best characterize the general transition between the two groups of ceramics since the only real basis for separation is the fiber-temper/sand-temper attribute. Ceramics of both temper types occur within Rabbit and Clear Mounts at Groton Plantation in similar contexts, furthering the contention that the sand-tempered types are transitional (Stoltman 1974: 215).

Within the Savannah drainage system, the locations of Thom's Creek and Refuge sites appear to be similar to those of the Late Archaic. Stoltman (1974: 215, 216) has mentioned that the Early Woodland ceramics occur in both floodplain-terrace and upland associations. This general pattern would seem a reasonable expectation for the Savannah River Plant because of the similar environmental contexts in the two localities.

Beyond the ceramic assemblages, little is really known of the Thom's Creek and Refuge phases, especially in terms of lithic artifacts. This paucity of information makes any inferences concerning the first half of the Early Woodland inconclusive. The overall similarity between Stallings sites and Thom's Creek/Refuge sites may provide some evidence to support a functional similarity argument although this is only conjecture at this time.

Deptford Phase evidence, in contrast to the preceding phases, has been recovered from sites on the Atlantic and Gulf Coastal Plains from North Carolina to Florida to Alabama. Milanich (1973) has provided the most comprehensive examination of the Deptford Phase throughout its geographic range. This study views the Deptford Phase as a non-agricultural economy dependent on intensive hunting and gathering. It is most readily identified in the archaeological record by sand-tempered ceramics with linear check-stamped, simple-stamped, and check-stamped designs (Milanich 1973; Caldwell and Waring 1939).

Within the Savannah River region, Deptford is well represented by evidence from the Bilbo Site (Williams 1968: 152-197), the Deptford Site (Williams 1968: 140-151), the Refuge Site (Williams 1968: 198-208), White's Mound (Phelps and Burgess 1964), the Groton Plantation sites (Stoltman 1974; Peterson 1971), Lewis Site (Hanson 1985),

and the St. Catherine's Island Burial Mounds (Thomas and Larsen 1979). The majority of information concerning the Deptford Phase in the Savannah River region concerns ceramics with only minimal reference to the associated assemblages. The only general association present at these sites are small triangular projectile points, small-stemmed projectile points, shell and bone ornaments and tools, and assorted flake tools. Milanich (1973), however, suggests that Deptford sites have diverse lithic assemblages similar to those found in the Late Archaic with the exception of point types. This limitation in the information base for assemblages of Deptford can be traced to a rather single-minded concentration of most investigators on the ceramic development of the Deptford waregroup with little attention to the other characteristics of the assemblage. Milanich (1973) must be credited with one of the only efforts directed at the reconstruction of the entire lifeway associated with the Deptford ceramic pattern; however, much of his information and results are focused on the coastal region and the Gulf sub-region that are far removed from the Savannah River.

The spatial distribution of Deptford sites has been investigated at Groton Plantation with the conclusion that the Deptford ceramic sample is distributed equally between the floodplain and upland (Stoltman 1974: 273). This pattern of increased use of the uplands is believed to correlate with an increasing dependence on the biotic resources of non-floodplain environments. Thus, one may expect to find Deptford ceramic sites in the areas of the plant removed from the swamp, such as the terraces and banks along the major streams.

In summary, there is a stylistic change in ceramic design that is correlated with a general change in settlement pattern during the Early Woodland period. This period is one of transition from the floodplain-oriented subsistence base in the Late Archaic to a more diffuse subsistence base in the Woodland, evenly distributed in most environmental contexts. The known settlement pattern present on the Savannah River Plant supports this conclusion in that sites of moderate and high artifact frequency and size occur on terraces and floodplains while those of smaller size and lower content occur in the uplands. This pattern suggests an increased use of the uplands indicative of a more diffuse subsistence base (Hanson, Most and Anderson 1978).

Middle Woodland (A. D. 1 to 700)

Most cord-marked ceramics with sand temper are included in the Wilmington Cord Marked (or Wilmington Heavy Cord Marked) type described by Caldwell and Waring (1939) and Stoltman (1974). Although sherd temper is considered to be a major attribute of this type (Caldwell and Waring 1939), Stoltman (1974: 25) argues that sand-tempering can be considered within the range of temper variabilty for the type since all other characteristics of the ceramics found at Groton Plantation fit the description. Basically, Wilmington is identified by a predominance of coarse cord-marked ceramics within the Savannah River area.

Sites that contain Middle Woodland ceramics within the Savannah drainage range from the mouth of the river to the Fall Line. These include Oemler, Walthous, Meldrim, Cedar Grove, Deptford Bluff, Greenseed Field, King's New Ground Field, White's Mound, Rabbit Mount, Clear Mount, and several others in Groton Plantation (Stoltman 1974: 24-27). Information from these sites primarily concerns ceramics with the notable addition of mound associations (Stoltman 1974) in several cases. Within the Groton Plantation survey, the majority of the ceramic sites occurred within the upland province in contrast to the preceding periods.

Little is known of the assemblages associated with the ceramics of this phase, but data from the Groton Plantation study allow for some understanding of the general settlement pattern. Stoltman (1974: 214-215, 236-241) concludes that since almost 80% of the Wilmington ceramics recovered in the survey were found in the uplands, a concentration on upland resources was the base of the subsistence technology, including some form of slash-and-burn agriculture. Although this is a conjecture based on minimal evidence, the strong association of these ceramics in the non-floodplain environment would indicate a shift in settlement and possible subsistence patterns. If this is the case, then the Middle Woodland should be a well-represented period within the plant because of the large area of upland composed of terraces and the Aiken Plateau.

Although a distinction could not be readily made between Middle and Late Woodland sites on the Savannah River Plant because of a lack of good diagnostic artifacts, the arrangement of these sites mirrors the pattern at Groton Plantation (Hanson, Most and Anderson 1978). Sites of these time periods are scattered throughout the Savannah River Plant.

Late Woodland and Mississippian (A. D. 700 to 1700)

These two general periods have been combined because of a general lack of distinction between the ceramics of the Savannah I and II phases in the area of the study. The diagnostic ceramic type of the Savannah I Phase is Savannah Cord Marked (or Savannah Fine Cord Marked) defined by Caldwell and Waring (1939), while Savannah Complicated Stamped, Savannah Check Stamped and Savannah Burnished Plain are considered as diagnostic of the later Savannah II Phase (Stoltman 1974: 27-31). The problem arises from the lack of exclusiveness in the two ceramic distributions, i.e., Savannah Cord Marked almost always occurs with the latter types. Thus, from about A.D. 700 to 1200, the Savannah ceramic wares predominate without a great deal of distinction.

The Savannah phases are documented at sites from the Fall Line to the Atlantic Coast. Hollywood Mound, which was partially excavated by DeBaillou (1965) and Thomas (1894), is located near Augusta, Georgia, on the Savannah floodplain. The site contains all types of Savannah Ware ceramics associated with a large, multi-staged temple mound (DeBaillou 1965: 6-10). Although other sites with Savannah ceramics are known from the middle Savannah River, only Lawton Field (Moore 1899) has any published documentation. In the vicinity of Savannah, Georgia, the work of Waring (Williams 1968) and subsequent research during the Works Progress Administration period (Caldwell and McCann 1941) has yielded several sites of the Late Woodland-Early Mississippian period.

Deptford, Haven Home ("Indian King's Tomb"), and Irene are the best documented of these estuary region sites. Due to the rich cultural deposits contained within these sites, (e.g., burials, grave goods, whole vessels, mounds, beads, and other exotic material culture), the information base is much better than for earlier periods. The first two sites mentioned, Deptford and Haven Home, contain a limited series of Savannah ceramics and are used by Stoltman (1974: 27-29) to characterize the Savannah I Phase. Both sites contain burials and large accumulations of artifactual debris. Only the Savannah Cord Marked and burnished types occur at these sites, in association with earlier Wilmington ceramics. Unlike most earlier sites, Haven Home and Deptford contain numerous burials indicating a more concentrated mortuary practice than was previously known for the Savannah Area. This development appears to be continued and elaborated in the following phases.

Research by Moore (1899) and Caldwell and McCann (1941) has revealed the nature of development in the Mississippian culture at the Irene site. This complex mound center

documents the ceramic chronology from Savannah phases through the Irene Phase. Within the eight construction episodes at the Irene temple mound, ceramics of the Savannah phases are present in all levels, being gradually replaced by Irene ceramics in the final stages of the occupation (Caldwell and Waring 1939; Caldwell and McCann 1941: 43-46). Associated artifact assemblages for the Savannah phase occupation at Irene are unclear because of the pre-excavation disturbance at the site. Thus, one is faced with only a ceramic type description of the Late Woodland-Early Mississippian time period consisting of the Savannah Ware of complicated stamped and burnished sherds. Since only ceremonial sites have been excavated, and distributional inference would be misleading except to note Stoltman's comment that there was a "trend toward population nucleation (near floodplains)" (1974: 243), one may add to this the increased occupation of the estuarine area surrounding the mouth of the Savannah.

The Irene Phase has received greater attention in recent times along the coastal area of Georgia (Pearson 1977; Caldwell 1971). This phase, until most recently, has been defined by ceramics and mound complexes (Caldwell and McCann 1941; Caldwell and Waring 1939). Diagnostic ceramic indicators of this final Mississippian phase in the Savannah region are Irene Filfot Stamped, Irene Plain and Irene Incised (Caldwell and Waring 1939). Associated with these ceramics are mounds, flexed burials, shell ornaments, and some artifacts typical of the Southern Cult, a pan-Southeastern ceremonial complex of late Mississippian times. Irene evidence of subsistence reflects a reliance on corn, large mammals, fish, shellfish, and avifauna (Caldwell and McCann 1941).

Pearson's study of the coastal Irene settlement-subsistence pattern offers insight into the diverse subsistence base during the late Mississippian on Ossabaw Island (1977). The general results of the study indicates a structured settlement hierarchy composed of four site classes that correlate strongly with access to diverse environmental-resource zones. Smaller sites were associated with areas of less environmental variability while the large sites were located to provide maximal access to multiple resources (Pearson 1977: 96-98). Although this study examines an island-estuary situation, the value of the results is that the nature of late Mississippian settlement is more complex than the situation suggested by earlier results. In the context of the Savannah River drainage, Irene Phase sites must be examined with respect to diverse settlement structure and complex subsistence strategies. Previous work on the Savannah River Plant (Hanson, Most and Anderson 1978) located only five sites of the Mississippian period. Four of these occurred on the terraces of the Savannah River while only a single site was recorded in the uplands.

Prehistoric Background Summary

Gradual changes throughout the Holocene have resulted in changes in the resources available in the Savannah River area to prehistoric man and thus in his strategies to adapt to these changes.

The location of Paleo-Indian remains in this area suggest the focalization of food procurement on megafauna. Michie (1977) implies that sites on the margins of rivers would be the most favorable for these animals and thus a concentration of Paleo-Indian subsistence efforts for their procurement.

The Early Archaic period is accompanied by a warming climate and the exploitation of a wide range of plant and animal resources. A more diffuse subsistence strategy relying on the seasonal use of a great variety of resources scattered over a greater number of microenvironments is reflected by the first intensive use of upland areas within the

Savannah River Plant boundaries (Brooks and Hanson 1979: 9). This environmental diversification is accompanied by a gradual diversity of tool assemblages needed to accomplish these new procurement tasks.

The Middle Archaic represents a continuance of this trend. Middle Archaic components are almost evenly divided between the different microenvironments recognized for the Savannah River Plant (Brooks and Hanson 1979: 9).

Evidence for the Late Archaic also demonstrates a very diffuse subsistence strategy but with an increased emphasis on riverine resources. Shellfish became abundant and were heavily used for the first time (Stoltman 1974). Artifact assemblages were much more diverse than in previous periods including for the first time large numbers of ground stone tools, grinding tools, and both ceramic and steatite vessels.

The presence of diverse faunal assemblages, massive shell middens, diverse tool assemblages, and numerous features at some riverine sites indicates the first relatively sedentary populations. Stoltman (1972, 1974) suggests a largely riverine adaptation with some upland utilization. Sites on the Savannah River Plant do fit this pattern. Brooks and Hanson (1979: 10) recognize that the sites of the uplands within plant boundaries seem to contain fewer artifacts and be smaller than the terrace-floodplain sites.

The Early and Middle Woodlands represent a gradual lessening of reliance on floodplain resources. Hanson (1981: 12) suggests that a relative depletion of riverine aquatic resources caused by changes in river gradients and population growth prompted by reduced mobility resulted in the gradual reliance on upland resources. The Early Woodland sites on the Savannah River Plant seem to be more evenly distributed between the riverine and upland environments (Brooks and Hanson 1979: 12) and reflect an increased use of the uplands, suggesting a more diffuse resource base than the Late Archaic (Hanson, Most and Anderson 1978). Middle Woodland sites seem to be restricted to the uplands (Hanson, Most and Anderson 1978). Stoltman (1974: 214-215, 236-243) suggests a concentration on upland resources and perhaps some form of slash-and-burn agriculture.

The Late Woodland and Mississippian periods seem to be a continuation of the Middle Woodland settlement pattern. Use of terraces and floodplains take precedence over sandhills, but more use of the uplands is apparent than in the Late Archaic and Early Woodland periods.

by Alexander Wood at Point Comfort (38AK228, the Lewis site) contained over 1000 head of cattle at his death in 1757. At this time, the term "cattle" also included horses and pigs. The second site, 38BR291, is as yet undocumented, however, excavations at this site afford a look at the life of a well-to-do cattle farmer.

European settlement of the central Savannah River area began in the mid-1730s with the origins of Augusta and New Windsor. The area of New Windsor, opposite Augusta, with Fort Moore at its center, was thinly settled.

Euro-American settlement of the Three Runs Area probably began in the 1730s. The Proprietary/Royal government considered the Savannah River Valley as the frontier/border between Spanish Florida and English Carolina from 1670 to the founding of Georgia. Early records show that from 1690 English fur traders used several locations just below Augusta as trading centers with the Indians. The earliest trading center is recorded as Savanno Town, occupied by various tribes, but specifically by Shawnee at different times. The Proprietary/Royal government entreatied with many tribes to take up residence along the Savannah River as a buffer to warn of approaching Spanish, beginning with the Westoes in 1670 through Yamassee, Yuchi, Appalachians, Appalachicolas, Shawnee, and ending about 1775 with the final departure of the last band of Chicasaws. After the Yamassee War, the government set up a system of frontier forts; two were located on the Savannah River. The first was at Savanno Town (Fort Moore); the second was Fort Prince George, located at Palachicola Old Town. Fort Moore served also as an Indian trading center until the development of Augusta's Indian trading center and Galphin's trading post at Silver Bluff (McDowell 1955; McDowell 1970).

Fort Prince George served as an outpost for about 20 years. The main objective of the Rangers stationed there was to guard the river. They would sail or row a piraque up to Fort Moore and down to Savannah (Ivers 1972, 1974; McDowell 1955).

From the time of the first English fur traders in the area, buckskins and fur pelts became the most valuable commodities from Cherokee and Creek traders. Obviously the furs were not obtained free; the government, in order to keep the Indians friendly, regulated the trade of furs for goods. Carolina Indian traders did not just trade in Carolina, but pushed westward to trade in both French and Spanish territories in Florida and Alabama. The Carolina fur traders were perhaps the most aggressive traders in North America.

With the founding of Augusta, about 1735, the Carolina fur trade began to decline. Settlers brought cattle and farming into the Three Runs area. However, before farming could begin, the land had to be cleared. Not to waste their efforts, the early settlers cut trees and in turn manufactured pitch and tar. For a number of years, processed meat and naval stores (pitch and tar) were the chief exports from the area.

Until the formation of New Windsor township in 1733, there were few settlers in the Barnwell/Aiken area near the Savannah River. The Royal government used many methods to bring settlers into the area: bounties for settlers, free land and pamphlets were written to entice settlers. Two of the more famous pamphlet writers and those responsible for many immigrants (mostly from Switzerland) were Johannes Tobler and Jean Pierre Purry. Tobler helped bring settlers to New Windsor, while Purry brought settlers to Purrysburg in the mid-to-late-1730s and after.

Beginning in 1736, a trickle of German-Swiss moved into the area. Johannes Tobler, with his family and 50 other Swiss families, set out from Switzerland for Carolina (Cordle

1939) to settle the New Windsor area. In 1572, Tobler started printing the South Carolina and Georgia Almanac. Although not printed every year, it was the first literary adventure in the Carolina backcountry (Meriwether 1974: 179). This portion of the backcountry was slowly settled and had its detractions as well as attractions.

> New Windsor . . .had achieved a reputation for ungodliness. Land in the region was not productive, and New Windsor's principal source of income was derived from the Indian trade. George Galphin, who established a base at Silver Bluff a few miles below Fort Moore, carried on a thriving business with the Creeks from about 1750 to the Revolution (Wright 1976: 87).

The settlement of Georgia took a somewhat different turn. It was not until Oglethorpe landed at Yamacraw Bluff in 1733 that Georgia began to be settled (McCall 1909: 21). In 1733, a treaty with the Creek Indians granted the Crown "all the lands and territories as we (the Creeks) have no occasion to use" (McCall 1909: 259). The territories specified were "all the lands between the Savannah and Altamaha Rivers, extending west to the extremity of the tide water. . ." (McCall 1909: 25). Along the Savannah River, settlement was slow; until the Treaty of 1763, people settled only slightly above Augusta (McCall 1909: 208), as problems with the Creek Indians held progress to a minimum.

The Revolutionary War was the next hindrance to new immigrants. Although the Savannah River Plant area itself saw no real action, Augusta was besieged three times by the American forces. In 1781 battles around the plant area included Wiggins Hill and Beech Island (McCrady 1901: 552). Vince's Fort, on Lower Three Runs Creek, was evacuated by Rebel forces upon hearing of the approach of Tory troops (McCrady 1901: 476). Rebel and Tory groups in the area surged back and forth, burning each others houses and scaring away others (Brown 1894).

With the end of the Revolution, the area once again recieved new settlers and large tracts of unimproved and unclaimed land began to be cleared for crops. Although farming practices differed greatly, the majority of farmers cultivated large tracts of land with little or no thought to fertilizing, or contour farming. The land quickly became worn out and the farmer would either move on to a new farm or open up a new tract of land (Sosin 1967: 173). Eli Whitney, near Savannah, and Robert Watkins, in Elbert County, Georgia, improved on older cotton gins (Watkins 1796: 1), helping cotton to become a major cash crop in the pre-Civil War years. Prior to the regional rail system, cotton and tobacco were transported to market by river carriers, either poleboats or steamboats.

Immediately after the Revolutionary War, Winton County (Aiken, Allendale, Barnwell and Edgefield counties) was formed and a court system set up that administered the area. From 1786 to 1789, the formative years of Winton County, the court ordered roads to be built, and local landowners were ordered to oversee its construction and maintenance. One such road, 38BR286, was ordered to be constructed on 19 October 1786. This was the road from Silver Bluff to Mathews Bluff, crossing Steel Creek either on Stephen Smith's or Bartlett Brown's land by the Steel Creek Bridge (Holcomb 1978).

With the coming of the Civil War, agricultural production slowed, as it did in most of the South. With most able bodied men in the army, there were few to keep the plantations running efficiently, especially towards the end of the war. Research to this point implies that Federal troops were probably in the area during Sherman's march from Savannah to Columbia (Bartlett 1956), but whether or not they did damage to area plantations is unknown.

The era of reconstruction brought an end to the southern antebellum lifestyle, as the end of slavery brought difficult time to southern planters. Because it was no longer profitable to run large plantations when the help had to be paid, large plantations were broken up into smaller units for tenant farming. Better transportation and mechanization that would make farming on a large scale by individual landholders profitable were still in the future.

Once the railroads build tracks through the plant area, small towns along their routes and crossings sprang up.

> Ellenton was born when the Charleston and Western Carolina Railroad was built in the 1870s. The section that ran from Charleston, South Carolina, to Augusta, Georgia, cut through Robert Jefferson Dunbar's plantation near his big three-storied home where the superintendent of construction, Mr. Millett, boarded. He became so charmed with Mr. Dunbar's attractive nine-year-old daughter, Ellen, that he requested the company to name the station near the Upper Three runs neighborhood for her (Cassels 1971: 3).

By 1900 the Savannah River Plant area could boast of having nine small towns or communities (Ellenton, Dunbarton, Hawthrone, Donora, Hattieville, Robbins, Meyers Mill, Greenland, and Bush), and seven of these had rail connections. Population figures for Silverton township in Aiken County indicate a population increase in 1900, but a decrease in 1910. Fourmile township in Barnwell County decreased during that same period. Ellenton's population rose steadily from 1890 to 1910 (Bureau of the Census 1913). Once the railroads connected stations near enough for planters to economically transport their staple crop to the railroad, then river transport was no longer necessary. The railroads cut the time of transporting goods to the Augusta market. The ease of using rail transport would have allowed these late-nineteenth-century planters to move further from the river. Area farmers probably brought crops for shipment to Savannah either to Point Comfort, near Ellenton, or to Stoney Bluff Landing, near the mouth of Lower Three Runs Creek. Once the railroads came through the area, river transport all but died.

Blacks left the plantations when their former masters were unable to provide them with food or work. Blacks, at least in Georgia, began moving to the cities by the thousands (Brooks 1914: 16), and others moved westward.

By 1912 the Talatha Telephone Company and the White Pond Telephone Company were operating in the Savannah River Plant area (Caughman 1912: 361, 365, 370). The Ellenton area was served by the Cassels Telephone Company, however, research has not yet determined the period and area served. In 1929, the town of Dunbarton signed a 30-year franchise with the South Carolina Power Company for electrical power. In 1929, there was a 50KVA hydro-electric power station owned by the town of Ellenton, named Western Carolina Oil and Power Company, and served a territory with a population of 620 (S.C. Power Rate Investigating Committee 1931). The company existed until about 1936. The dam was known as Cassels Pond and had a back-up gas engine generator. By 1938, Ellenton and Dunbarton were on the transmission line from Barnwell (Public Service Commission Map 1938).

During World War I, large scale migration of rural southern Blacks to the urban North resulted in large Black ghettos (Kellogg 1977: 310). This migration was caused in part by the fact that land farmed in the South could no longer support them and the northern cities offered a promise of industrial employment. This migration left many southern

tenant farms empty and fields fallow. Plantations that employed tenants to work the plantation did all they could to survive. The documents relating to the Ashley Plantation (38BR101, 273-283, and 494) indicate that the plantation was indecline, the foreman, in lo of rent was repairing tenant dwellings in hopes of recruiting new tenants. The owner tried growing tobacco, took in northern hunters during the season and provided beaters and guides. They went so far as to renovate the old family home to accomadate more people. There are many factors involved with the decline of southern farms, prehaps one of the most important was that the land could no longer support profitable crops. The land was exhausted by cotton production. Without extensive fertilizing, which was expensive, crops could not be supported by the depleted soil.

Until ca. 1735, the Three Runs area was visited only by English traders from Charles Towne, seeking furs from the nearby Indian inhabitants of Savanno Town. As can best be deduced from available records, actual settlement of the Three Runs area began in the late 1730s by Europeans with Royal Grants to the land. The area was sparcely settled until the end of the Revolutionary War. It was not until the 1820s-1830s when the area became more densely settled and most farmable land was under cultivation. With the end of Reconstruction, even the xeric uplands were settled. At the end of World War I, a portion of the Black population moved to the northern cities seeking employment. Because of this migration north, the larger tenant-farmed plantations began to become unprofitable and declined. Before the Korean War began, several of the area's tenant plantations were barely keeping up agricultural production. The general population and agricultural decline of the area was one of many factors leading to selection of this region for the construction of the Savannah River Plant.

Chapter III

ENVIRONMENT AND HUMAN ADAPTATION

Introduction

Human systems, regardless of their level of technological complexity, have been subject to general and specific nuances of the environments in which they have operated. In order to establish the environmental framework within which human populations adapted in the vicinity of what is now the proposed transmission line right-of-way, this background is provided. Two types of environmental information are provided: 1) a paleo-environmental overview, which presents the general reconstruction of late Pleistocene and Holocene conditions within the southeastern Atlantic Coastal Plain and 2) a discussion of the Savannah River Plant in terms of specific elements of the effective environment partitioned into microenvironmental zones. These reconstructions are not a first attempt in the region (cf. Hanson and Most 1978), and they are not offered as a comprehensive statement of the total environment. Rather, the reconstructions are presented in terms of the effective environment (i.e. the variables in an environment that affect humans).

Paleo-environmental Reconstruction

This presentation of extant information of the general paleo-environment has been drawn from research conducted in the southeastern Atlantic Coastal Plain over the past 20 years by investigators attempting to document the evolution of flora in response to changing climatic conditions (e.g. Watts 1971, 1975, 1980; Watts and Stuiver 1980; Bond 1971; Whitehead 1963, 1965, 1973; Delcourt and Delcourt 1981; Sheehan, Whitehead and Jackson 1982; and Carbone 1983). Additional information was obtained from the work of Goodyear, House and Ackerly (1979) which provides a general southeastern synthesis of available research within an archaeological context. The majority of the research used to document the trends in ancient climates was conducted in Georgia, Florida and North Carolina, areas which offered suitable preservation of pollen, stratigraphy and datable material to establish chronological ordering (e.g. Watts 1975; Watts and Stuiver 1980; Bond 1971; Whitehead 1965, 1973). A single study based on sediments and pollen in South Carolina was conducted by Watts (1980) at White's Pond, near Columbia. Across this Atlantic Slope region, the general vegetational history has been documented to be similar. Table 2 synthesizes the general trends in the region and provides inferences relevant to physiographic zone-specific variation in the broader patterns. The following discussion correlates directly with the general trends presented in the tabular summary.

Full Glacial (23000 - 13000 B.C.)

Pollen studies at White's Pond, South Carolina, (Watts 1980); Bob Black and Quicksand Ponds, northwest Georgia (Watts and Stuiver 1970); Pigeon Marsh, northwest Georgia (Watts 1975); and Singletary and Bladen Lakes (Whitehead 1965, 1973) indicate a full glacial climatic condition in the region, which was xeric and cold. Throughout the Piedmont and Coastal Plain provinces of the region, cold-adapted vegetation composed of predominatly spruce and jack pine characterizes the pollen records. These species, accompanied by less common oak and ironwood, suggest a much colder and drier climate than exists today (Watts 1980: 326).

TABLE 2

GENERALIZED PALEO-ENVIRONMENTAL RECONSTRUCTION
FOR THE TERMINAL PLEISTOCENE AND HOLOCENE

EPISODE	INFERRED CLIMATE	VEGETATION	DATES AND SAMPLE LOCATION
Full Glacial 23000 - 13000 B.C.	Much colder and drier than present	General Trend- Jackpine, spruce, herbs with a small occurrence of deciduous tree species.	White's Pond, S.C. 17150 - 10860 B.C. (Watts 1980)
16000 B.C.	Warm, temperate	Physigraphic zone(s) - specific - Southeast Coastal Plain - Oak, hickory and Southern Pine with hardwood forestS along major river valleys. A band of mixed northern hardwood/boreal conifer forest along the northern transitional margin (Middle Atlantic region) containing fully boreal jackpine/spruce forests.	(Delcourt and Delcourt 1981)
	Cool (?), temperate	Piedmont and South - Central Georgia - Patchy mosiac with local stands of boreal conifers and areas mantled with more mesic hardwood forests. Oak and other deciduous trees uncommon. Abundant and diverse herb taxa with boreal affinities suggest park-like vegetation frequently interrupted by patches of trees and shrubs.	(Sheehan, Whitehead and Jackson 1982; Watts 1971; Watts and Stuiver 1980 - Sheelar Lake, N. Florida)
Late Glacial-Early Post-Glacial 13000-8000 B.C.	Warmer and moister than glacial; cooler and moister than present	General Trend- Oak, hickory, beech, and hemlock	White's Pond, S.C. 10860 - 7550 B.C. (Watts 1980) Pigeon Marsh, Ga. 11050-8850 B.C.

TABLE 2 (Continued)

GENERALIZED PALEO-ENVIRONMENTAL RECONSTRUCTION
FOR THE TERMINAL PLEISTOCENE AND HOLOCENE

EPISODE	INFERRED CLIMATE	VEGETATION	DATES AND SAMPLE LOCATION
			Singletary Lake, N.C. 9050 B.C. (Watts 1975) Bladen Lake, N.C. 9050 B.C. (Whitehead 1965, 1973)
12000-8000 B.C.	Increased warmth, drier	Physiographic zone(s)-specific - Northern Georgia to Northern Florida - Forests became denser with pine and oak gradually colonizing previously unforested areas, suggesting a return to drier conditions.	(Sheehan, Whitehead and Jackson 1982; Carbone 1983)
Early Holocene 8000-5000	A continued warming trend accompanied by increased moisture	General trend - Oak and hickory maximum. Sharp decline in beech and increase in gums.	White's Pond, S.C. 7550-5050 B.C. (Watts 1980) Bladen Lake, N.C. (Whitehead 1965)
Late Holocene 5000 B.C. - Present	Continued warming with gradual desiccation	General trend - Oak and pine. Pine increases relative to the decreasing oaks. Generally modern vegetation patterns develop by 5000 B.C.	Okefenokee Swamp, Ga. 3250 B.C. (Bond 1971) White's Pond, S.C. 5050 B.C. (Watts 1980)
3000 B.C.	Hypsithermal interval	Physiographic zone(s) - specific - Piedmont, Gulf and Atlantic Coastal Plains - Change toward more open vegetation with oak and hickory replacing Southern Pine on the sandy uplands of the Gulf and Atlantic Coastal Plains. Oak-hickory-Southern Pine forest restricted to the Piedmont.	(Delcourt and Delcourt 1981; Carbone 1983)

TABLE 2 (Continued)

GENERALIZED PALEO-ENVIRONMENTAL RECONSTRUCTION
FOR THE TERMINAL PLEISTOCENE AND HOLOCENE

EPISODE	INFERRED CLIMATE	VEGETATION	DATES AND SAMPLE LOCATION
Post - 3000 B.C.	Essentially modern	Continued reversal of of pine dominance and development of cypress swamps	(Carbone 1983)

Late Glacial (13000 - 8000 B.C.)

A trend toward increased deciduous species marks this climatic episode as indicated by an abundance of oak, beech, hickory, black walnut, hemlock, hazelnut and ironwood (Watts 1980). These species reached a peak in occurrence during the period between 10860 and 7550 B.C. at White's Pond (Watts 1980). Spruce and jack pine greatly declined across all sample areas (Watts 1975, 1980; Watts and Stuiver 1970; and Whitehead 1965). The oak/hickory/hemlock/elm vegetation pattern extant during this period reflects a relatively warmer and moister climate than existed during the full glacial (Watts 1980: 326). It is during this climatic episode that the first well documented human occupation of the region occurs.

Post Glacial (8000 B.C. - present)

During the early Holocene segment of this period (8000 - 5000 B.C.), the oak and hickory vegetation pattern reached a maximum density and distribution throughout the region. Walnut, hemlock and hazelnut disappear from the pollen record. By 7550 B.C., the occurrence of hickory and ironwood species had greatly declined compared to previous high levels. Replacing these species were sweetgum and blackgum, which accompanied the more persistent oaks (Watts 1980; Watts and Stuiver 1970). The changes in vegetation prior to 5000 B.C. suggest several episodes of rapid warming accompanied by increased moisture.

By 5000 B.C. a major change in climate probably began as indicated by a pine maximum and concomitant rapid decrease in the percentage of gums (Watts 1980). Combined with the persistent oak vegetation, the pine suggest an overall drier climate than existed earlier in the Post Glacial (Watts 1980; Whitehead 1965: 390). Studies by Watts (1980) and Bond (1971) indicate that this pattern of mixed pine and oak represents the initiation of both modern climatic and vegetation conditions in the region. From this time forward, the nature of environmental variability does not register in the pollen studies.

Reconstructed Environments

As indicated in the preceding section, the general vegetative pattern in the southeastern Atlantic Slope has been basically similar over the past 7,000 years with the exception of areas altered by the economic pursuits of Euro- and Afro-American populations. Given a similar climate and overall vegetation pattern, it is possible to reconstruct the local environmental situation that existed since about 5000 B.C. The purpose of such a reconstruction is to examine the local variability in elements of the effective environment and to use this variability to predict the nature of human settlement and subsistence behavioral patterns. Such an investigation assumed that human behavior such as subsistence activities were directly related to the availability of natural resources.

The proposed transmission line right-of-way offers an excellent laboratory for the examination of variability in human settlement-subsistence patterns in that the local environment varies widely from xeric uplands to hydric swamps. On the regional level, the study area falls within the Upper Coastal Plain physiographic province, which is composed primarily of unconsolidated sediments of Cretaceous age or younger (Langley and Marter 1973: 17). This general area falls within the Oak-Hickory-Magnolia Forest Ecotone described by Shelford (1963: 86-88). It is characterized by a pine to scrub oak succession in xeric areas and a more stable oak-hickory sere in hydric contexts.

The climate common in the region is best described as mild, with monthly temperature averages ranging from 48°F in January to 81°F in July and an annual mean humidity of 70% (Langley and Marter 1973: 65). Precipitation averages 47 inches with extremes ranging from 28.8 inches to 73.5 inches (Langley and Marter 1973: 73).

The general topography of the study area can best be described in relation to the surface geological structure composed of two major components: the Aiken Plateau and the Pleistocene Coastal Terraces. Composed of sandy sediments, the Aiken Plateau dominates the study area and generally ranges in elevation from 250 feet to 400 feet within the Savannah River Plant. Below the 250-foot elevation level are three coastal terraces: The Wicomico (below 100 feet), the Sunderland (between 100 and 170 feet), and the Brandywine (between 170 and 250 feet). The Wicomico is essentially the Savannah River floodplain of the recent era that floods on a seasonal basis. The Sunderland is a generally level feature that parallels and bounds the Savannah River swamp. Finally, the Brandywine is a well-dissected terrace that forms the transitional zone between the Aiken Plateau and the Sunderland (Siple 1967; Stevenson 1982).

The specific topography of the study area results from the erosive activity of streams on the plateau and terraces. Above the 150-foot contour, the presence of the terraces all but disappears due to this erosive activity. In general, the topography is most appropriately described as steep and dissected with river and small stream terraces adjacent to the channels.

The distribution of soil types in the area are described by Aydelott (1973). Although the study of soils was conducted for the specific purpose of forest management, the general information obtained can be used in the evaluation of the soils for a reconstructed vegetation pattern. The association of specific soil types in topographic zones will form the basis for delineating microenvironmental zones.

Microenvironmental Zones

Using the information provided by Aydelott (1973) for soils and the topographic variability present in the area, four microenvironments were defined for use in the examination of settlement variability. These conform with basic vegetation communities defined and described by Beavers et al. (1973) and Langley and Marter (1973) as the xeric, mesic, small stream hydric, and large stream hydric. However, because the emphasis in this study is upon the effective environment (i.e. those elements of the environment suitable for human exploitation), the zones defined below differ to some extent. Each of the microenvironmental zones is presented in terms of six key variables: elevation range, general topography, soils, vegetation, hydrology, and food resources.

Zone I: Upland Sandhills

Elevation range: 170 to 400 feet a.m.s.l.

General topographic context:

Primarily large interfluvial ridges that gradually slope to the south. This zone is composed mainly of areas within the Aiken Plateau and the Brandywine terrace.

Soils:

All soils in the upland sandhills zone are predominatly sandy and include the following types: Americus, Vaucluse and Blaney, Dothan and Norfolk, Fuquay and Wagram, Orangeburg and Red Bay, Troup, and Gunter and Lakeland.

Vegetation:

Very xeric on the high ridgetops grading to less xeric on the terminal ridgenoses and slopes. Referred to as a Xerosere by Shelford (1963: 86-87), this community contains longleaf pine, turkey oak, blackjack oak, bluejack oak, southern red oak, short-leaf pine and loblolly pine (Beavers et al. 1973: 34-35). More mesic stands contain a higher proportion of oaks relative to pines. According to Barry (1980: 97-116) this range in xericity accounts for three graded vegetation systems: the turkey oak barrens, the scrub oak barrens and the xeric pine-mixed hardwoods. Overall, this zone contains a very high density of small red oak group species which are excellent mast producers.

Hydrology:

Small streams with one or two branches are characteristic of this zone. Also, some Carolina Bays and springs occur in the zone. However, the water resources are not year-round and would prohibit long term prehistoric occupation in the zone.

Resources:

Overall, the resources of this zone are the least dense of any zone, with the exception of oak mast. The low ground water content and related vegetative xericity result in broad water differences in seasonal resources productivity. Of particular interest is the high red oak group ("bitter") acorn productivity in the zone. This resource, unlike white oak group ("sweet") acorns are more predictable from year to year and much more efficient to procure and leach (cf. Reidhead 1976: 229-236). Further these acorns are able to resist worms due to their extremely tough shells. Finally, these acorns are more reliable as a resource because they do not germinate until late winter (Fowells 1965: 557-620; Olsen 1974: 692-701). This latter point makes the red oak group acorns important deer fodder during the winter which results in higher deer density in the upland sandhills during winter.

Zone II: Mesic Terraces

Elevation range: 90 to 170 feet a.m.s.l.

General topographic context:

Gradually sloping terrace (Sunderland) between the upland sandhills and the Savannah River swamp. Small backwater swamplands intrude into this zone in the vicinity of the Savannah River swamp.

Soils:

The predominant soil types situated in this zone are Kalmia and Johns, Ocilla and Albany, Troup (terrace phase), and Lucy and Wagram. Although sandy, these soils are very high in biotic productivity making the zone an excellent locus of food resources.

Vegetation:

Although the vegetation in this zone varies depending on edaphic conditions, the predominant community type is best described by Beavers et al. (1973: 34-35) as mesic. Barry (1980: 138-140) refers to this community as the mesic mixed hardwood and pine type which is characterized by a white oak dominance with loblolly pine. Other species common to this zone are black oak, swamp chestnut oak, willow oak, mockernut hickory, pignut hickory, water oak, sweetgum,

persimmon, ash and dogwood. The actual composition of this community varies due to successional and soil parameters. Shelford (1963: 87) states that succession usually results in an oak-hickory climax.

Hydrology:

Ranging from small headwater streams originating in the sandhills to the larger tributaries of the Savannah River, the water resources near this zone are quite variable. Of importance is the fact that this zone is always very near permanent streams and the associated bottomland, thus making Zone II an excellent intermediate location for access to both the upland sandhills and the small stream bottomlands.

Resources:

The entire range of terrestrial fauna occur in this zone making it an excellent hunting area during all but the winter season. The lack of good winter mast density in the zone due to low frequencies of red oak species may have made hunting a less productive pursuit compared to the upland sandhill zone. Other resources occur in moderate to high densities in this zone during most months of the year except winter. For this reason food procurement in the winter may have required either seasonal movement of residence to other resource zones or logistic foraging to these zones (Binford 1980). Overall, given the optimal location of this zone between two other zones and its moderate to high food resource productivity during most of the year, prehistoric inhabitants of the area would have most probably used this zone as a locus of long term residence and/or base camps.

Zone III: Tributaries and Bottomlands

Elevation range: 85 to 225 feet a.m.s.l.

General topographic context:

This zone crosscuts the elevation ranges of the upland sandhills and mesic terrace because it follows the course of creeks and their tributaries from the Savannah River swamp to the sandhills. Although the total gradient of the stream system drops 140 feet in approximately 12 miles, no radical drops in the channel are present. This gently falling stream system thus has a moderate floodplain/bottomland along most of its margin. Since the streams and the bottomland are so mutually associated, the two are combined in this zone.

Soils:

Two soil types, Johnston and Okenee, and Grady and Bayboro, are most common in this zone. Each type is composed of finer-textured soils than found in other zones in the watershed and as a result is capable of holding more moisture. High nutrient values of these soils contribute to a very high productivity (Aydelott n.d.).

Vegetation:

Beavers et al. (1973: 34-35) and Langley and Marter (1973) refer to the community in the bottomlands of this zone as the small stream hydric. This community situated along narrow to moderately wide floodplains is characterized by black gum, sweetgum, yellow poplar, green ash, red maple, loblolly pine, and scyamore. In the middle reaches, a large stream hydric pattern exists which includes willow oak, water oak, overcup oak, nuttal oak, swamp chestnut oak, cottonwood, and

sycamore. Near the junction with the Savannah River, swamp bald cypress and tupelo gum would have been common. A recent vegetation gradient study of the Upper Three Runs Creek bottomlands by Whipple (1978) indicates that the actual composition of the community is closely associated with water levels and periodicity of flooding. Generally most oak species tend to lack water tolerance and occur away from areas regularly flooded or saturated. Overall, the vegetation in this zone grades along the water course from moderately useful food species in the upper reaches to highly useful food species in the middle reaches to poor food resources in the lower reaches.

Hydrology:

Throughout the zone, water from flowing permanent streams is abundant. Small streams and springs provide continuous supplies of water in all areas. From a point roughly 2 miles upstream from the Savannah River swamp, the streams are narrow enough during nonflood seasons to have permitted the use of wiers and nets for procurement of fish.

Resources:

In terms of year-round productivity and overall resource diversity, this zone has the potential to have provided the greatest amount of food to prehistoric hunter-gatherers. The cover provided by shrubs, vines and herbs (Whipple 1978) are capable of supporting very high deer populations. Whitetail deer tend to spend part of the day in this type of zone and the remainder in the terrace and sandhill zones. This diurnal pattern of movement would make Zone III a superb hunting area. Other fauna of both the terrestrial and aquatic types are moderately dense in the zone relative to Zones I and II. Fish are available on a permanent basis in the streams, while anadromous species enter the streams during the late winter and spring. Procurement of fish would have been a simple matter of placing either nets or wiers across the channel and collecting the catch regularly.

Vegetal resources would have been fairly dense in the zone and have provided a major dietary contribution. At least seven oak species, hickory, grass seeds, berries, and shoots are common in the zone. The only problem with the vegetal resources may have been the relative small area encompassed by the zone. Only 12% of the total land area in the Steel Creek watershed is in Zone III, and about 35% of this area is water. Thus, although the diversity and density of this zone are high, the zone could not have provided the total dietary requirements of any population above a minimal number, at least for vegetal resources.

Finally, the presence of resident and migratory avifauna in this zone would have made it more important to prehistoric inhabitants. Twenty-three species of avifauna spend at least a portion of the year in this zone and all of these birds are edible. Although these may not have been a critical resource due to possible problems in procurement, the fowl could have been an excellent caloric and protein source.

In summary, the food resources that would have been present in the tributary and bottomland zone are the densest and most diverse of any other zone in the region. The potential for near year-round exploitation would have made the zone very important as an energy extraction location. However, due to the presence of poorly drained soils and regular flooding, it is unlikely that human

groups would have resided within the zone. Rather, by situating in the mesic terrace zone (II) near Zone III, they would have had dry living areas and ready access to the streams.

Zone IV: Savannah River Swamp and Savannah River

Elevation range: 80 to 90 feet a.m.s.l.

General topographic context:

This zone crosscuts the elevation ranges of the upland sandhills and mesic terrace because it follows the course of creeks and their tributaries from the Savannah River swamp to the sandhills. Although the total gradient of the stream system drops 140 feet in approximately 12 miles, no radical drops in the channel are present. This gently falling stream system thus has a moderate floodplain/bottomland along most of its margin. Since the streams and the bottomland are so mutually associated, the two are combined in this zone.

Soils:

Two soil types, Johnston and Okenee, and Grady and Bayboro, are most common in this zone. Each type is composed of finer-textured soils than found in other zones in the watershed and as a result is capable of holding more moisture. High nutrient values of these soils contribute to a very high productivity (Aydelott n.d.).

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Hydrology:

Throughout the zone, water from flowing permanent streams is abundant. Small streams and springs provide continuous supplies of water in all areas. From a point roughly 2 miles upstream from the Savannah River swamp, the streams are narrow enough during nonflood seasons to have permitted the use of wiers and nets for procurement of fish.

Resources:

In terms of year-round productivity and overall resource diversity, this zone has the potential to have provided the greatest amount of food to prehistoric hunter-gatherers. The cover provided by shrubs, vines and herbs (Whipple 1978) are capable of supporting very high deer populations. Whitetail deer tend to

spend part of the day in this type of zone and the remainder in the terrace and sandhill zones. This diurnal pattern of movement would make Zone III a superb hunting area. Other fauna of both the terrestrial and aquatic types are moderately dense in the zone relative to Zones I and II. Fish are available on a permanent basis in the streams, while anadromous species enter the streams during the late winter and spring. Procurement of fish would have been a simple matter of placing either nets or wiers across the channel and collecting the catch regularly.

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In summary, the food resources that would have been present in the tributary and bottomland zone are the densest and most diverse of any other zone in the region. The potential for near year-round exploitation would have made the zone very important as an energy extraction location. However, due to the presence of poorly drained soils and regular flooding, it is unlikely that human groups would have resided within the zone. Rather, by situating in the mesic terrace zone (II) near Zone III, they would have had dry living areas and ready access to the streams.

Zone IV: Savannah River Swamp and Savannah River

Elevation range: 80 to 90 feet a.m.s.l.

General topographic context:

The swamp zone is an irregular floodplain which has varied relief due to channel movements and associated geological formation processes. In the area at the mouth of Steel Creek the swamp is about 1.5 miles at its widest point. Throughout the swamp are a series of elevated ridges which parallel the river and form seasonal dry land. Thus, the topography of swamp, rather than being uniform as suggested by the topographic maps of the areas, consists of ridges and swales.

Soils:

No specific information exists on the soils of the swamp since Aydelott (n.d.) did not map its soil distributions nor did he evaluate the productivity of the area. Generally, the sediments in the upper surface levels of the swamp are predominantly silts and sands, which are depositional in origin (Stevenson 1981). Ridge soils are sandy and moderately well drained.

Vegetation:

Barry (1980) characterizes this zone as cypress-tupelo swamp which is composed of bald cypress and water tupelo in setting with alluvial deposits and open water circulation. This vegetation system is that which dominates the Savannah River swamp swales. Other common species associated with cypress and water-tupelo are water ash, black willow, water elm, red bay, sweet bay magnolia, and American elm. On the ridge islands which are never subjected to continuous inundation by flood waters, oaks similar to those found in the mesic terrace zone are common, as are longleaf and loblolly pines. Of importance is the fact that the islands are in most cases long and narrow with not too much dry surface area. This fact would diminish their importance as oak mast procurement areas. However, the oaks are capable of supporting moderately high deer populations during the fall.

Hydrology:

During most of the year the Savannah River swamp is partially flooded by modern stream and river flow. Prior to the construction of the two dams in the upper Savannah River, flooding was a recurring event that inundated the entire swamp-floodplain. The water run-off from Pen Branch, Four Mile Creek and Steel Creek would have contributed to the swamp water levels. Due to this problem with flooding, the low-lying areas of the swamp would have had an impossible habitation area. The islands, on the other hand, would have afforded adequate protection from flood water to have been suitable residences during at least part of the year. Evidence from Stave Island, a large point-bar remnant in the swamp, suggests occupation during the Late Archaic and possibly the Woodland periods.

Resources:

The aforementioned whitetail deer were probably an important resource procured from the swamp. Further, terrestrial manmals such as bear, rabbit, raccoon, and squirrel are common. Muskrat and beaver are also very common. Although the migratory birds are low relative to Zone III, a high density of wood ducks would have provided some food value. Aquatic resources including freshwater mussels, resident and anadromous fish, and turtles are very common in the river and swamp. Procurement of these species would have been a relatively low-cost endeavor. As noted by Limp and Reidhead (1979), the netting of fish and other aquatic fauna is a very economical activity which can produce extremely high food yields for labor expended. This fact suggests that the use of this zone would have been quite great. A review of the food resource data from the Rabbit Mount site (Stoltman 1974) supports the contention that swamp resources were used extensively during the Late Archaic and Mississippian periods.

Overall, the resources of the swamp would have been available during most parts of the year, but procurement would not always have been equally economical. High flood waters would have made focused net fishing difficult because fish would have been able to move over most of the swamp. Instead, fishing would have been best during summer when water levels were lower and the swales became small lakes, or sloughs. Terrestrial and aquatic mammal exploitation could have been quite good if access to the resources was not inhabited by flood waters. In general this zone would have had an excellent source of fish, mussels, vegetal foods, and mammals.

The Structure of the Resources and Archaeological Implications

Variability in topography, hydrology, elevation, soils, vegetation and resources characterizes the project area and constitutes the basis for the definition of microenvironmental zones. Each of these zones would have contained food resources for the prehistoric human occupants of the area in varying quantities during different seasons of the year. This differential availability of resources would have established a basic structure in the effective environment, that would have been a central consideration in the development and implementation of procurement strategies. As components of the strategies, activity and habitation loci would be expected to reflect the structure in the environment. Because the emphasis in the present study is upon the nature of prehistoric settlement and subsistence, the distribution of different site types is examined in association with zones of resource production.

From the structure of the environment the following expectations can be deduced regarding the general structure of a seasonal subsistence activity system. Two of the zones would have been rather inhospitable for long-term settlement due to excessive moisture and poorly drained soils; these are the Savannah River swamp (Zone IV) and the tributary/bottomlands (Zone III). With the expection of the small islands that occur in the swamp, no habitation or large scale limited activity loci are expected in these two zones. However, due to the extremely high productivity of these zones, they are expected to have been seasonally exploited during most of the year for aquatic resources (e.g. fish, turtles, mussles and aquatic plants). Due to low water levels in the river, which would have existed during the late spring and summer (Baldwin 1973: 24; Trinkely 1974: 14), mussels and certain fish species would have been intensively exploited during these seasons. Thus given the conditions and paramenters of these two environments, the expectation for human activity and the resultant archaeological record is of two kinds. First, in Zone III, it is expected that sites would represent narrow activities such as fishing and hunting and that more permanent residential sites would be elsewhere. Second, sites in Zone IV would represent, at most, seasonal procurement of certain swamp resources. One possible exception to this would have been a more sedentary occupation (i.e. multi-seasonal) which seems to have occurred during the Late Archaic Period in the Savannah River as evidenced by the Rabbit Mount site (Stoltman 1974). These more sedentary occupations in the swamp zone always occurred on sand ridges and old point-bar remnants within the floodplain which would have afforded protection from flooding. Thus, the overall prehistoric site distribution within the swamp and bottomland zones is expected to be composed of limited activity sites representing the procurement of locally available resources.

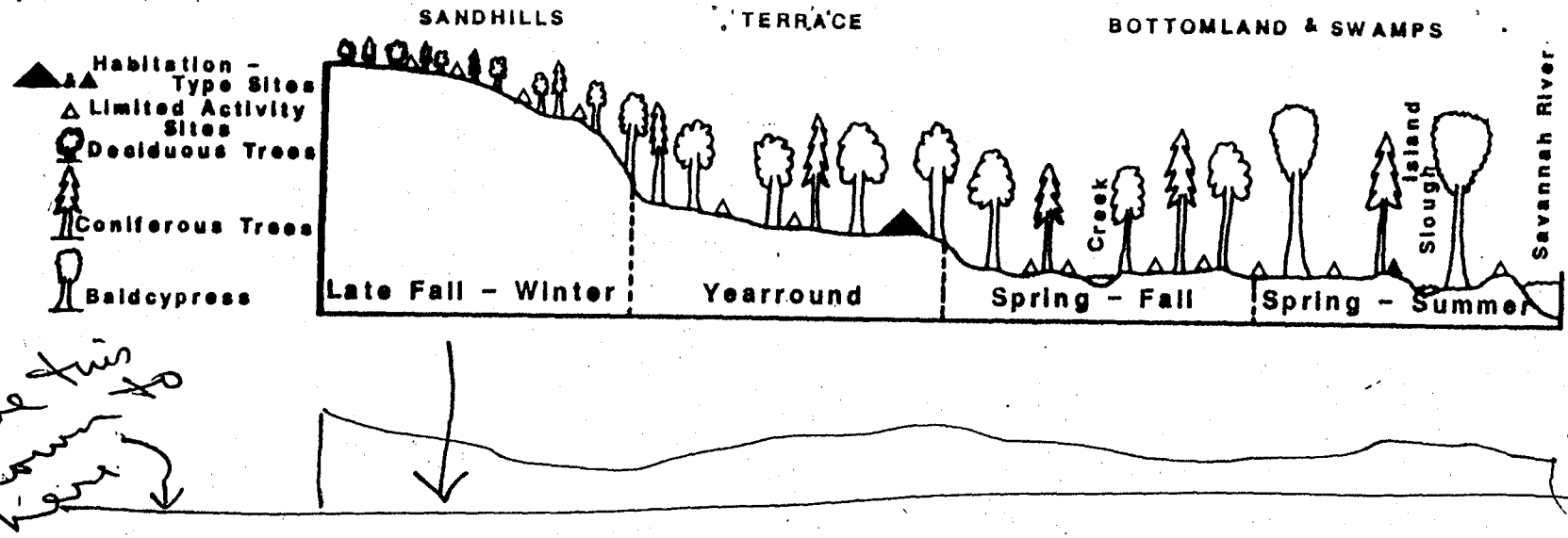
The zone with the greatest expected probability for yielding more permanent base camp and habitation sites is the mesic terrace. Four factors support this expectation. First, this zone is highly productive during the spring, summer and fall. Second, the soils and topography in the zone would have afforded prehistoric inhabitants with dry and protected areas for dwelling. Third, all areas within this zone are within 1 km of permanent water provided by streams. Fourth, if we assume that most of the prehistoric inhabitants of the region were dietary generalist (i.e. those who selected food resources in direct proportion to their occurrence in the environment), then this zone would have been the ideal residence location during most of the year because of the central location of the zone in immediate proximity to the tributary/bottomlands and the upland sandhills. By locating more permanent base camps and habitation in this zone, prehistoric groups would have been able to follow a logistic mobility pattern (Binford 1980) to exploit the more seasonally specific zones nearby.

Finally, the resources within the upland sandhills are, for the most part, available in the highest density during the late fall and winter. Although certain fauna use this zone during the entire year, the greatest concentration of deer occurs concomitant with the high red oak mast maturity. A limiting factor in the zone is water that occurs only in small springs and intermittent tributary streams. Furthermore, the large area represented by this zone (i.e. 75% of the watershed) and relative uniformity of the resource distribution over time would have contributed to decisions regarding human exploitation patterns. Thus, given the relative lack of water, the seasonal nature of the resources, and the evenness of the resource distribution, it is expected that the upland sandhills would have been used primarily during the late fall and winter for the procurement of oak mast and whitetail deer. The archaeological correlates of this activity set would be relatively small, limited-activity loci with assemblages reflecting low-activity diversity. Because the collecting of bitter oak mast would require leeching in the flowing stream (Reidhead 1976: 233-236), no evidence of acorn processing is

expected in this zone, but rather in the mesic terrace and tributary/bottomland zones. Hence, the primary contribution to the archaeological record would have been the hunting and meat-processing activities. These would have resulted in the deposition of broken tools, exhausted flake tools, and resharpening debitage (House and Ballenger 1976). So with these material correlates considered, the expected site type in this zone would be small lithic scatters with evidence of meat processing expressed in the assemblage. The distribution of these sites is expected to be spatially random due to the even resource distribution.

To recapitulate, the seasonal settlement model proposed above suggests that under the assumption of a general dietary selection (Cleland 1976), exploitation would have consisted of three environmentally determined components. First, aquatic resources would have been collected during the spring and summer in Zones II and IV from small camps or stations within the zones that served as specialized activity loci visited for brief periods. Residence would have been in Zone II. Second, during late fall and winter, subsistence activity would have shifted to the upland sandhill zone for the procurement of deer and acorns. Since these activities would not have required facilities or long-term processing in the zone, use of the area would most probably have been during short term visits. Again habitation during these seasons is expected to have been in the mesic terrace zone. Third, the use of the mesic terrace zone is expected to have been the most intensive in terms of habitation and daily subsistence procurement, because the zone offers a rich multi-seasonal resource base and is intermediate between the lowland and upland zones. Sites within this zone would have been due to two types of activity: 1) long-term habitation for multiple seasons with assemblages reflecting diverse activities, and 2) limited activity associated with specific resource procurement. The former type of sites would have most probably been located near the contact edge between the mesic terrace and the tributary/bottomland or Savannah River swamp because of the improved access to water and aquatic resources. The latter type of sites would reflect the general resource specific procurement activities away from the habitation sites in the mesic terrace zone. Due to the richness and diversity of resources in the zone, no specific expectations can be made for the nature of the assemblages other than an expected low artifact diversity. A generalized model of this settlement subsistence system is presented in Figure 1.

The preceding model of human land use constitutes the central focus of the prehistoric analyses that will be discussed in the report. It is through the examination of such models that archaeological sites can be evaluated to measure the scientific value of the archaeological resources. This is not to say that only settlement subsistence models are valuable criteria for assessing sites, but only that they form a basic first step in determining the information content of sites. As the sites are better understood, certain specific questions relating to chronology, culture change, ceramic variability, and other general problem domains can be addressed.



	ZONE I UPLAND SANDHILLS	ZONE II MESIC TERRACES	ZONE III TRIBUTARIES AND BOTTOMLAND	ZONE IV SAVANNAH RIVER AND SWAMPS
KEY RESOURCES	Red oak acorns, deer, small terrestrial mammals, seeds, and hickory nuts	White and red oak acorns, deer, small terrestrial mammals, seeds, greens, turkey, berries and fruits.	Fish, aquatic fauna, waterfowl, deer, small mammals, red and white oak acorns, greens, fruits, berries and seeds.	Fish, aquatic fauna, freshwater mussels, small mammals, deer greens, seeds, some acorns, and hickory.
SEASON(S) OF MAJOR UTILIZATION	Late fall and winter	Spring, summer, fall and winter	Spring, summer and fall	Spring and summer with minor use in fall
ACTIVITIES	Acorn and hickory gathering, deer hunting and processing, small game hunting, seed collecting, general foraging, and short term camping.	Acorn and nut gathering, small mammal hunting, deer hunting and processing, vegetal food foraging, food processing and storage, and habitation.	Fish procurement with spears and wiers, deer hunting, waterfowl hunting, acorn collecting, vegetal food foraging, and possible short-term camping.	Fish procurement with spears, nets, wiers and traps, mussel collecting, some deer hunting, and general vegetal foraging.
ARCHAEOLOGICAL CORRELATES	Small lithic and/or ceramic scatters, debitage indicative of tool maintenance, broken hunting and meat processing tools, sites dispersed throughout the zone, and overall low lithic assemblage diversity.	Large base camp and habitation sites near either Zone III or Zone IV, high lithic assemblage diversity, seed and nut processing tools, storage containers, debitage reflecting tool manufacture and maintenance, and some small low tool diversity sites.	Stream-edge fishing stations, fish traps and wiers, scattered meat processing sites with low tool diversity, broken hunting and meat processing tools, and a dispersed pattern of non-fishing sites.	Levee and slough edge fishing/mussel collecting stations, hunting and meat processing sites on islands, overall low tool diversity at all of these small sites, and possible large base camps on islands.

Figure 1: A general settlement-subsistence model for the Savannah River Plant.

Chapter IV

Methods

Field Methods

The purpose of the field survey was to examine the entire path of the proposed transmission line for archaeological sites and to obtain data to evaluate the significance of each site through test excavation and surface collection. Each arcaheological location was examined using standard field methods which are presented in this section.

Prior to implementation of the field survey and testing for the transmission line, the proposed corridor maps provided by South Carolina Electric and Gas were compared with the master site maps for the Savannah River Plant to determine the location of known sites. Information for all known sites near the transmission corridor was then examined to provide a preliminary assessment of the archaeological resources. Through the use of this preliminary data on site locations and content, field crews were able to determine the exact locations and content, and the exact association between known sites and the transmission line corridor while in the field. Finally, the entire 17 mile corridor was surveyed and staked at 100 foot intervals by South Carolina Electric and Gas personnel before fieldwork was initiated.

Fieldwork was divided into three task specific phases in order to best utilize field time and to allow for phased decisions regarding level and extent of testing. Phase one fieldwork consisted of actual surface and subsurface survey along the powerline right-of-way. Two crews consisting of three individuals walked the corridor inspecting all cleared ground areas and other subsurface exposures. This was achieved by distributing the crew members perpendicular to the centerline at ten meter intervals, thus the entire 100 foot corridor was inspected for archaeological material. In areas where sediment deposition was known to have occurred (i.e. terrace edges) during the prehistoric period, subsurface shovel tests were placed at ten meter intervals along the corridor centerline. All soil removed from the tests was screened through 1/4" hardware cloth to recover any cultural material. No previously unrecorded archaeological sites were located during this phase of the survey.

Phase two consisted of re-examination and testing of three of the five known archaeological sites (38BR35, 38BR104, and 38BR333). Two sites (38BR190 and 38BR205) recorded during previous SRP research were determined to be present only in surface contexts. Systematic subsurface testing at that time yielded no artifactual material. Shovel testing at the remaining sites employed a systematic procedure which was centered on the site datum at the center of the surface transects extending outward from the datum. Each 25 by 25 centimeter test was excavated to determine artifact density and site distribution. Special attention was given to the determination of archaeological materials within the transmission line corridor. Specific information pertaining to the three sites is presented in a latter section of the report.

Phase three research involved the excavation of two by two meter units at two sites (38BR35 and 38BR104), where surface and subsurface artifact densities were determined to be highest. Each unit was excavated in ten centimeter arbitrary levels because no culturally meaningful strata were recognized during phase two testing. All soils were screened through 1/4" hardware cloth sieves. Recovered artifacts were placed in plastic bags with appropriate provenience information and transported to the lab at the end of each work day. Field records describing soil changes, artifact locations, and other

pertinent information were recorded on standardized forms which are curated by the South Carolina Institute of Archaeology and Anthropology.

In summary, the field methods employed in the survey were those developed by the Savannah River Plant Archaeological Research Program for use in Upper Coastal Plain contexts (c.f. Hanson, Most and Anderson 1978 and Hanson, Brooks and White 1981). These methods have been refined over the course of 12 years through the benefit of a large survey sample in excess of 775 archaeological sites located across a broad environmental range. Although quantified predictive models of site location have not been formalized to date, certain regularities in site type-geographic location have been employed in the formulation of the human ecological model (Hanson, Brooks and White 1981) which provides a basis for examining settlement variation within a theoretical perspective. The fact that no previously unrecorded archaeological sites were discovered attests to the effectiveness of the general Savannah River Plant survey and supports the prediction that human use of the xeric sandhills was limited to brief foraging and collecting episodes which are represented by sparse to non-existant archaeological records.

Laboratory Analysis Methods

Introduction

All archaeological materials recovered during the course of the survey were logged and subsequently washed at the Savannah River Plant Archaeological laboratory. Prehistoric and historic artifacts were further sorted and cataloged by provenience, level (where appropriate) and major artifact class.

Prehistoric Analysis

The analysis of prehistoric materials was undertaken in accordance with standard analytical procedures established for the Savannah River Plant Archaeological Research Program. These procedures were designed in order to record a wide range of technological, functional and temporal data essential for addressing specific aspects of the model presented in Chapter 3. The prehistoric artifact classes consist of debitage, flake tools, hafted bifaces, other bifaces, other lithic tools (ground, polished, battered, pecked, etc.), fire-cracked rock, ceramics, and other artifacts and materials.

Debitage: This class was analyzed according to the presence or absence of cortex, with additional subclasses defined on the basis of raw material, presence or absence of thermal alteration, and whole vs. broken flakes. The flakes within each subclass were counted and recorded. The combined subclasses were then weighed. These data are particularly useful for examining technological variability.

Flake Tools: Flake tools are broadly subdivided into formally prepared unifaces and utilized flakes. Based on the techno-functional attributes recorded, these flake tool subclasses may be further subdivided (e.g. burin, graver, etc.). The flake tool attributes recorded consist of: raw material type; percent cortex; presence or absence of patina; presence or absence of indications of hafting; maximum length, width and thickness; number of used edges; edge(s) morphology and angle(s); and weight.

Hafted Bifaces: Most artifacts in this class are considered to be temporally diagnostic. Accordingly, they were initially classified as to established type, based on descriptions in the literature. Measures of attributes considered to be of techno-functional relevance were then recorded. These attributes are: condition (whole or, if broken, the fragment represented); raw material type; presence or absence of patina; maximum length and width (mm); blade length (mm); width @ ½ blade length (mm); shoulder and basal width (mm); maximum thickness (mm); weight (grams); presence or absence of evidence of resharpening; Broken (yes or no); presence or absence of basal grinding; basal type; and basal shape.

Other Bifaces: This broad class consists of such diverse subclasses as preforms, flake cores, axes, adzes, etc. Once sorted into these subclasses, measures of attributes considered to be of techno-functional relevance were then recorded. These attributes are: raw material type; presence or absence of patina; percent cortex; maximum length, width, thickness (mm); mean lateral edge angle; weight; and broken (yes or no).

Other Lithic Tools: This residual lithic artifact class consists of such diverse, and relatively uncommon non-flaked subclasses as ground stone, polished stone, hammerstones, etc. Once sorted into their respective subclasses, they were simply counted and weighed. Additional attribute analyses may be conducted in the future, contingent upon more focused research.

Fire-Cracked Rock: Fire-cracked rock includes a wide variety of igneous/metamorphic and sedimentary materials, usually in rounded (stream worn) cobble form exhibiting evidence of having been heated (reddened and/or crazed with irregular breakage patterns resulting from use in hearths, earth ovens or stone boiling). Broken cobbles exhibiting no definite evidence of heating or of any use-wear patterns are also included in this class.

Ceramics: Ceramics recovered were classified using the South Carolina Institute of Archaeology and Anthropology's comparative type collection (Anderson n.d.), emphasizing the traditional sorting criteria of surface finish, paste and temper within a type-variety analytical framework. Such a framework has the potential of being sensitive to geographic as well as to temporal variation.

Other Artifacts and Materials: This broad class consists of a wide variety of residual subclasses including such items as daub, cobbles, bone, shell, charcoal, and various rock and mineral fragments. Although a detailed analysis beyond identification, counting and weighing was not warranted, the mere presence of such minority items can often provide a valuable body of inter and intra-site comparative data which, when examined in light of the other data sets, can provide valuable insights into site functional variability.

Historic Analysis

The historic artifacts underwent several analyses. The first of which included the tabulation of the artifacts for the artifact tables. The second analysis included a close inspection of the glass and ceramics for distinguishable difference and/or individually marked pieces. Analyses of historic ceramics and glass were greatly facilitated by placing them on a white background. This was done because against a white background slight color changes in the glaze are readily distinguished. In the case of ceramics, pearlware exhibits a slight blue tinge in the glaze, as opposed to whiteware ironstone which exhibits none. The following artifact descriptions are keyed to the Historic Artifact tables in the site description.

Stoneware

Alkaline glaze stoneware: Date range 1800 - present (Greer 1970). Usual colors range from light yellowish green to olive green, probably of local manufacture.

Albany slip stoneware: Date range unknown. "Usually exhibited by a black, brown or white slip glaze over the body of the vessel, (South, personal communication)," probably locally made.

Earthenware

Whiteware: Date range 1813 - present (South 1977: 210-211). Whiteware/Ironstone appears in "various forms of hard whitewares and seim-porcelain that are extremely difficult to date with accuracy. . ." (Noel Hume 1970: 130-131).

Pearlware: Date range 1780 - 1830 (South 1977: 212). ". . . it can readily be distinguished by the way in which the glaze appears blue in crevices of footrings and around handles" (Noel Hume 1970: 130). Also exhibits a slight blueish color when held to a piece of white bond paper.

Glass

Opaque: Date range 1650 - 1880 (Noel Hume 1971: 62). This refers to that olive-green/olive amber colored glass that was produced without decolorizers, commonly called black glass (Noel Hume 1970: 71; Kendrick 1976: 52). As the name implies this glass is basically opaque or black in appearance, and poorly made containing many bubbles and stress marks (Noel Hume 1970: 60-71).

Modern: Date range as described below. This category is a catch-all for glass manufactured after 1860. The different types of glass recovered are described below.

Architectural

Cut nails: Date range 1790 - present (Noel Hume 1970: 253). Rectangular in shape, usually without a head, and tapering to square end rather than a point. The acidity of the soil in most of the project area made identification of this type of nail impossible due to deterioration of the metal.

Brick: No date range. Refers to collected brickbats.

Bone: No dating attemped. This bone fragment was not sufficiently large enough to identify except that it belonged to a large mammal.

Chapter V

Archaeological Resources

Prehistoric Sites

Portions of four prehistoric sites are known to exist within the proposed transmission line right-of-way. All four sites were discovered prior to this survey (Hanson, Most and Anderson 1978). Because 38BR35 and 38BR104 were considered potentially significant, they were revisited during the present survey and received secondary testing. In contrast, 38BR190 and 38BR205 were considered to have little research potential and were, therefore, not revisited.

In the following discussion, information relevant to 38BR190 and 38BR205 is extracted directly from Hanson, Most and Anderson (1978). Information pertinent to 38BR35 and 38BR104 is drawn from that report and from additional data obtained during the present survey effort. For each of the four sites, relevant site data are presented and, in light of these data, appropriate problems for future research are discussed.

38BR35: This prehistoric site is located along a high terrace immediately east of Four Mile Creek (Figure 2; site locational and environmental data are summarized in Table 3 and depicted in Figure 3). During the original survey, ceramic and lithic artifacts were found scattered for 200 meters along the terrace (Provenience 1-Ø, Table 4). Due to the site's proximity to the terrace edge, the liklihood of historic disturbance was deemed minimal. It was felt, therefore, that the site may have intact cultural deposits (Hanson, Most and Anderson 1978).

During the present survey, more intensive investigations (systematic subsurface testing relative to the site datum at S.C.E.&G. survey marker 109+22') served to delineate better the site extent (Figure 4) and internal structure (Figure 5). A comparison of the artifact assemblage inventory (Table 4) with Figure 5 demonstrates that the site does in fact have intact deposits, to a depth of 1.05 m, represented by Archaic through Late Woodland components. A Mississippian component is minimally represented as well.

As indicated by Provenience 7D-K (Table 4), the basal portions of the site may also contain one or more Archaic components. If the quantities of biface production debitage and associated tools can be considered indices of relative intensity of site use, then Archaic components may actually be most heavily represented.

Several interrelated factors strongly indicate a substantial Archaic component(s) at 38BR35. First, as indicated by Provenience 7 (Table 4), concentrations of lithic materials are below Woodland ceramics and extend to a considerable depth. Second, known terrace edge sites such as this on the Savannah River Plant (e. g., 38BR259, Brooks n.d.; 38BR383, Sassaman n.d.$_a$; and 38AK228, Hanson, n.d.) invariably contain ceramics, usually in conjunction with triangular or small stemmed/notched bifaces, when Woodland components are present. Conversely, assemblages in the basal levels of terrace edge sites consisting solely of lithic materials (e.g., 38BR259, 38BR383, 38AK228) have consistently been found to represent one or more preceramic Archiac components. Finally, the five large ovate-triangular preforms associated with the biface production debitage in Provenience 7D are consistent with those from 38BR259, 38BR383 and 38AK228 that are associated with large notched and stemmed archaic bifaces. Woodland bifaces, by comparison, are manufactured from flakes or small preforms.

Figure 3: Site Photograph, 38BR35

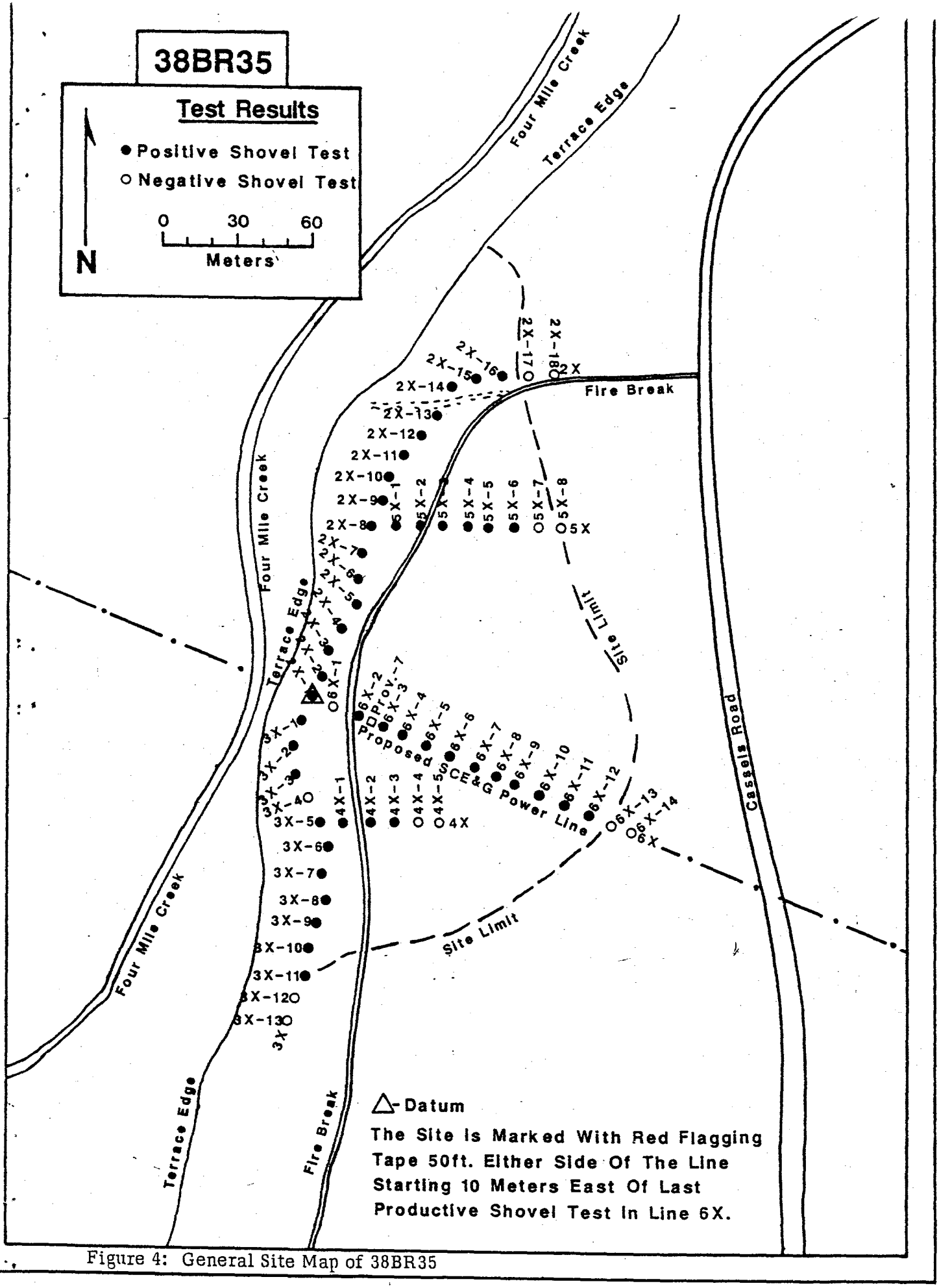


Figure 4: General Site Map of 38BR35

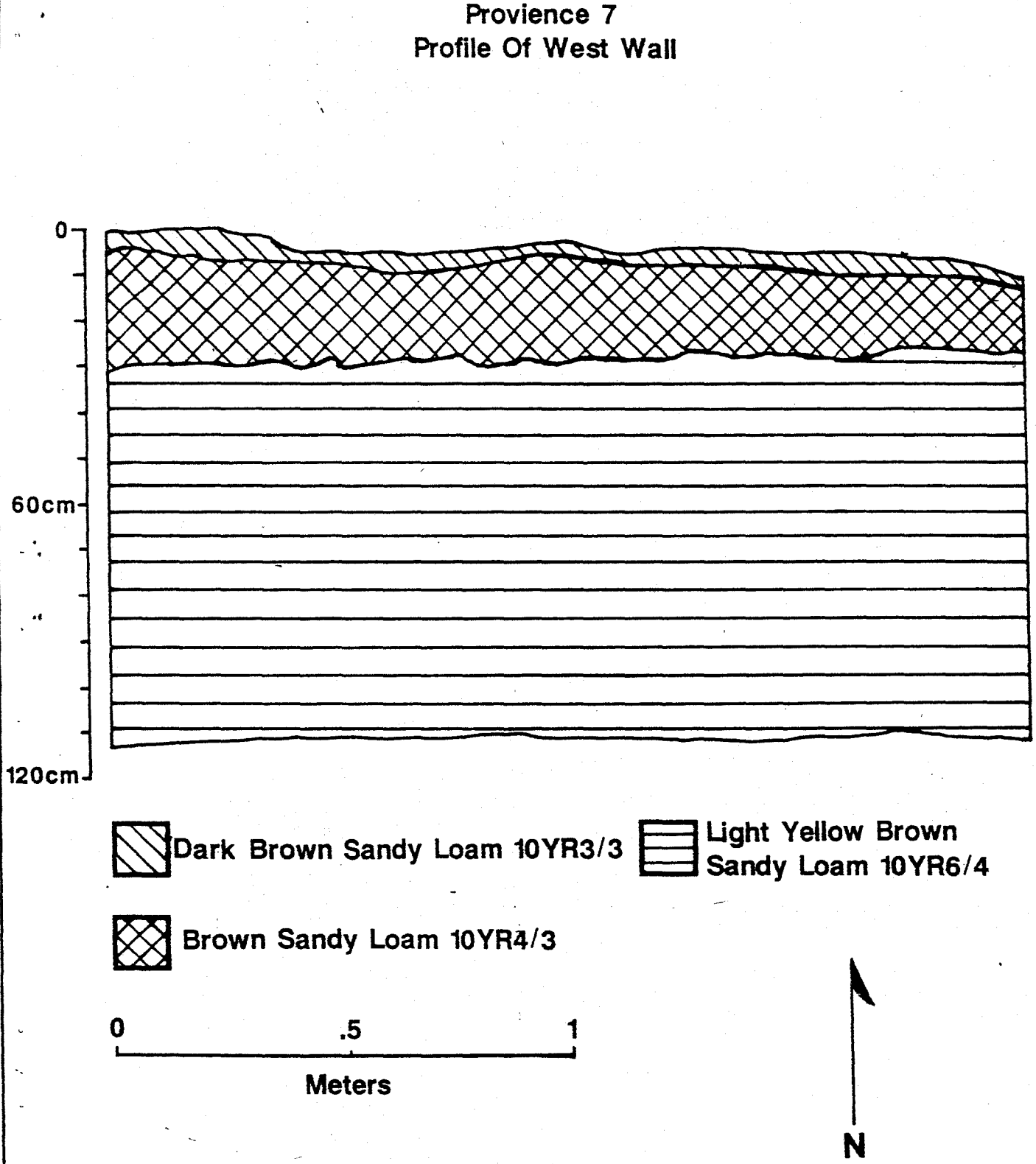


Figure 5: Stratigraphic profile of 38BR35, Provenience 7

This site contains excellent data relevant to four problem domains subsumed under the general research design for the Savannah River Plant, particularly research problems pertaining to the Archaic-Woodland transition (Hanson, Brooks and White 1981; Hanson 1982). Specifically, these problem domains are: 1) chronology refinement; 2) geoarchaeological investigations of fluvial sedimentation rates as related to site formation processes and paleoenvironmental reconstruction (Brooks et al. 1985; Brooks n.d.); 3) organization of Archaic biface production technology (Hanson and Sassaman 1984; Sassaman n.d.$_b$); and, 4) temporal variability in site function as directly relevant to the Archaic-Woodland transition and subsequent Woodland and Mississippian change.

38BR104: As indicated by the original survey (Proveniences 1-Ø through 6-Ø, Table 4), 38BR104 is characterized by an extensive scatter of prehistoric lithic debris located on a ridgeline immediately west of Steel Creek (Figure 2), and elevated about 50 feet above it. Based on the surface scatter of artifacts, it was determined that the site area extended over about two acres, with materials recovered in the cuts of access roads to the Seaboard Coast Railroad line and from the railroad bed profile. Diagnostic prehistoric artifacts consisted of a steatite fragment and a Kirk biface, indicating that Late and Early Archaic components, respectively, are represented.

The present survey provided little additional artifact assemblage information, but provided an opportunity to document better the sites environmental-locational setting (Table 3; Figure 6) and its areal extent (Figure 7). In addition, it was determined that whereas the area of the site in the vicinity of the railroad had undergone considerable disturbance, intact deposits are present and are concentrated at a considerable depth (compare Figure 8 with Table 4, especially Provenience 8E) within the proposed transmission line right-of-way.

The relatively deep, intact nature of this multicomponent Archaic site indicates that it can provide data relevant to a number of research problem domains. These domains are: 1) refinement of the Archaic period chronology; 2) geoarchaeological investigations of fluvial sedimentation rates as related to site formation processes and paleoenvironmental reconstruction (Brooks et al. 1985; Brooks n.d.); 3) organization of Archaic lithic tool production technology (Hanson and Sassaman 1984; Sassaman n.d.$_b$), and 4) Archaic as viewed from the upland, sandhills environment.

38BR190: This site is on a hillslope and is southwest of Meyer's Branch Creek (Figure 2). It is at an elevation of 245 feet and slope aspect is direct (Table 3; Figure 9). The site is characterized by a single chert flake recovered from the surface during the previous survey (Table 4). Systematic shovel testing at that time produced no additional material, which was justification for not revisiting the site during the present survey. As no additional material was recovered during subsurface testing, the date of the site is unknown. Consequently, it is not felt that this site can provide additional data relevant to archaeological research problems.

38BR205: This site is on a terrace west of Pen Branch and is adjacent to a small stream which is now dammed (Figure 2). The site is at an elevation of 130 feet and is facing southwest (Table 3). Vegetation consists of pine and hardwoods (Figure 10). A small scatter of lithic material was recovered from an area about seven by ten meters. No temporally diagnostic artifacts were found on the surface nor was any additional material recovered during systematic shovel testing (Table 4). Therefore, revisiting the site during the present survey was not considered justified. Similarly, it is not felt that this site can provide additional data relevant to archaeological research problems.

Figure 6: Site Photograph, 38BR104

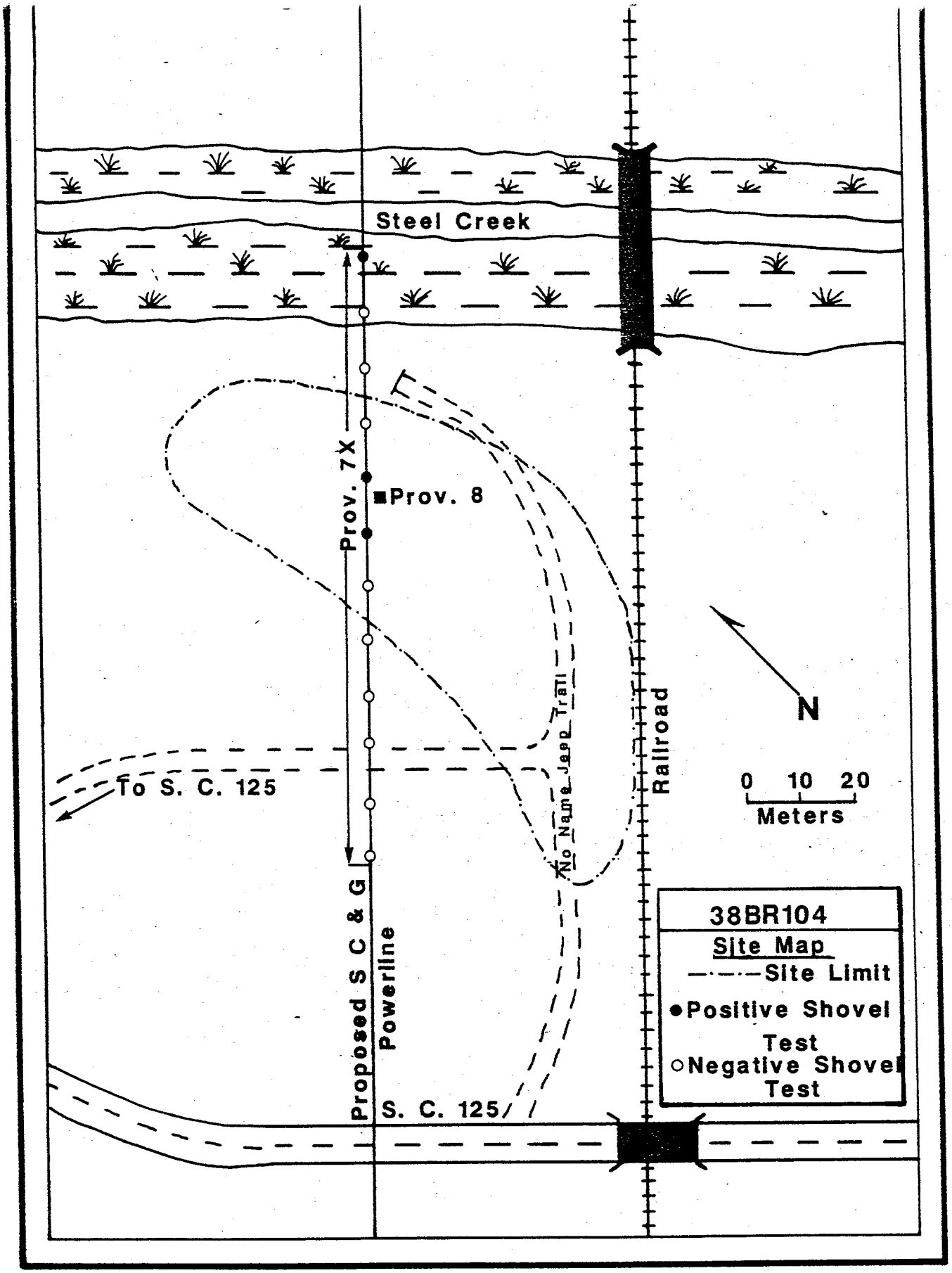


Figure 7: General site map of 38BR104

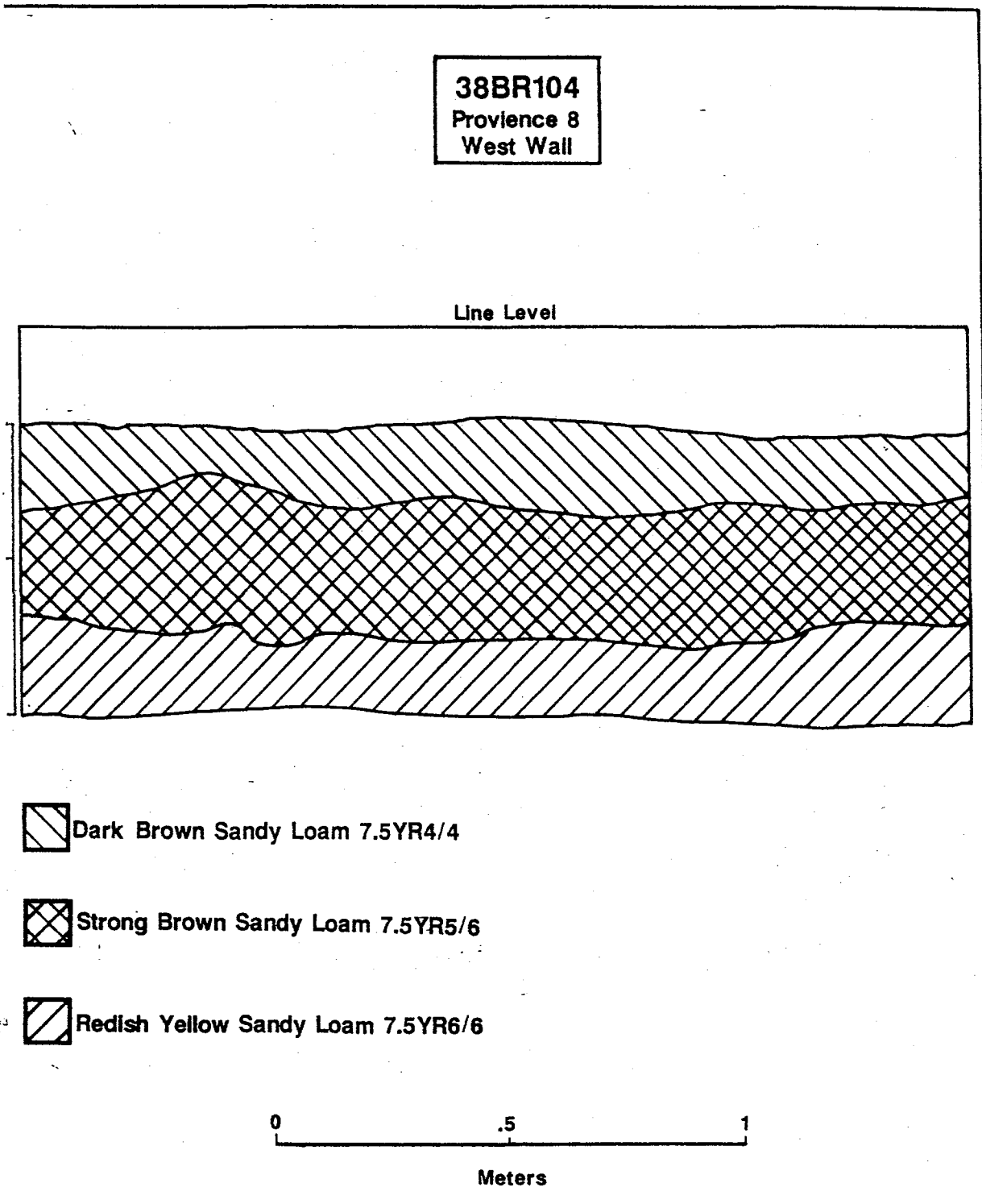


Figure 8: Stratigraphic profile of 38BR104, Provenience 8 (West Wall)

Figure 9: Site Photograph, 38BR190

Figure 10: Site Photograph, 38BR205

Historic Site

38BR333: This site was first located in 1980 during the survey of Four Mile Creek watershed. 38BR333 is situated between SCE&G corridor stations 186+0 and 186+69 feet, between SRP roads A-13.2 (Risher Pond Road) and Cassel's Road (Figure 2). The local landform is a terrace approximately 130 feet a.m.s.l. On site soils are Troup Sand (terrace phase) (Aydelott n.d.). Local vegetation consists of pine plantation with mixed pines and hardwoods.

Artifacts recovered from 1980 and 1985 investigations reflects a nineteenth to twentieth century occupation. Surface cultural material collections indicate a site size of 20 by 20 meters, however, subsurface testing indicated a site size of perhaps 10 by 10 meters (Figure 11). Subsurface testing revealed cultural material to a depth of 35 cm. Thirteen, 25 by 25 cm. shovel tests were dug to an average of 60 cm. and recovered 15 artifacts from three test holes. The material recovered was from proveniences 3X and 5X, at the datum and to the northeast (Figure 11). Figure 11 is the site map showing the relationship of the roads and shovel tests to the SCE&G right-of-way center line. Surface visibility afforded an excellant chance to surface collect the site, with visibility at 75%, however, few artifacts were recovered from the surface of the site. Figure 12, a photograph of the site, shows the relationship of the two roads and the site area between them. Risher Pond and Cassel's Road form a junction approximately 50 meters from the site datum.

The 1940 Corps of Engineers map (Ellenton, S.C. quad) indicates a single structure at this location, just north of Cassel's Road. With the construction of Risher Pond Road in the mid to late 1950s, after the government had acquired the property and either moved or bull dozed the structure, this site was graded over disturbing any surface and most subsurface integrity. This prior disturbance has interfered with the site integrity to such a point that any attempt at reconstructing architectural features or locating outbuildings would be impossible. The only functional reconstruction that can be attempted at 38BR333 is that the site at one time included a domestic dwelling.

Troup sand typically has a soil pH of between 4.5 and 6 (Rogers 1985), with the soil this acidic there is little chance for floral and faunal preservation. The soil pH and the paucity of surface and subsurface artifacts deemed it unnecessary to attempt secondary testing.

Utilizing the 31 recovered ceramics (Table 5) to place this site within a chronological sequence using South's Mean Ceramic Dating Formula (1977) the site dates to 1872.7. Calculating a standard deviation on this statistic provides an s.d. of 24.3 which gives a date range of 1848 to 1897 (Brooks and Hanson 1985). The ceramic seriation method (Brooks and Hanson 1985) supplements the MCD date and leads us to believe that this site's inferred function was a single occupancy. That the site was located on the Corps of Engineers map of 1940 does have its problems with the MCD. The artifacts do not coincide with the map either, they are of the period as indicated with MCDF. The logical conclusion to this is that the site was abandoned and the structure still standing when the 1940s map was printed, however, the maps are usually redrawn from earlier versions and this map may not have been field checked to extensively. That structures are left abandoned for long periods and are still standing for later maps is not necessarily an exception. This has been documented on the Ashley Plantation approximately 4 miles to the northeast (Brooks and Martin 1984).

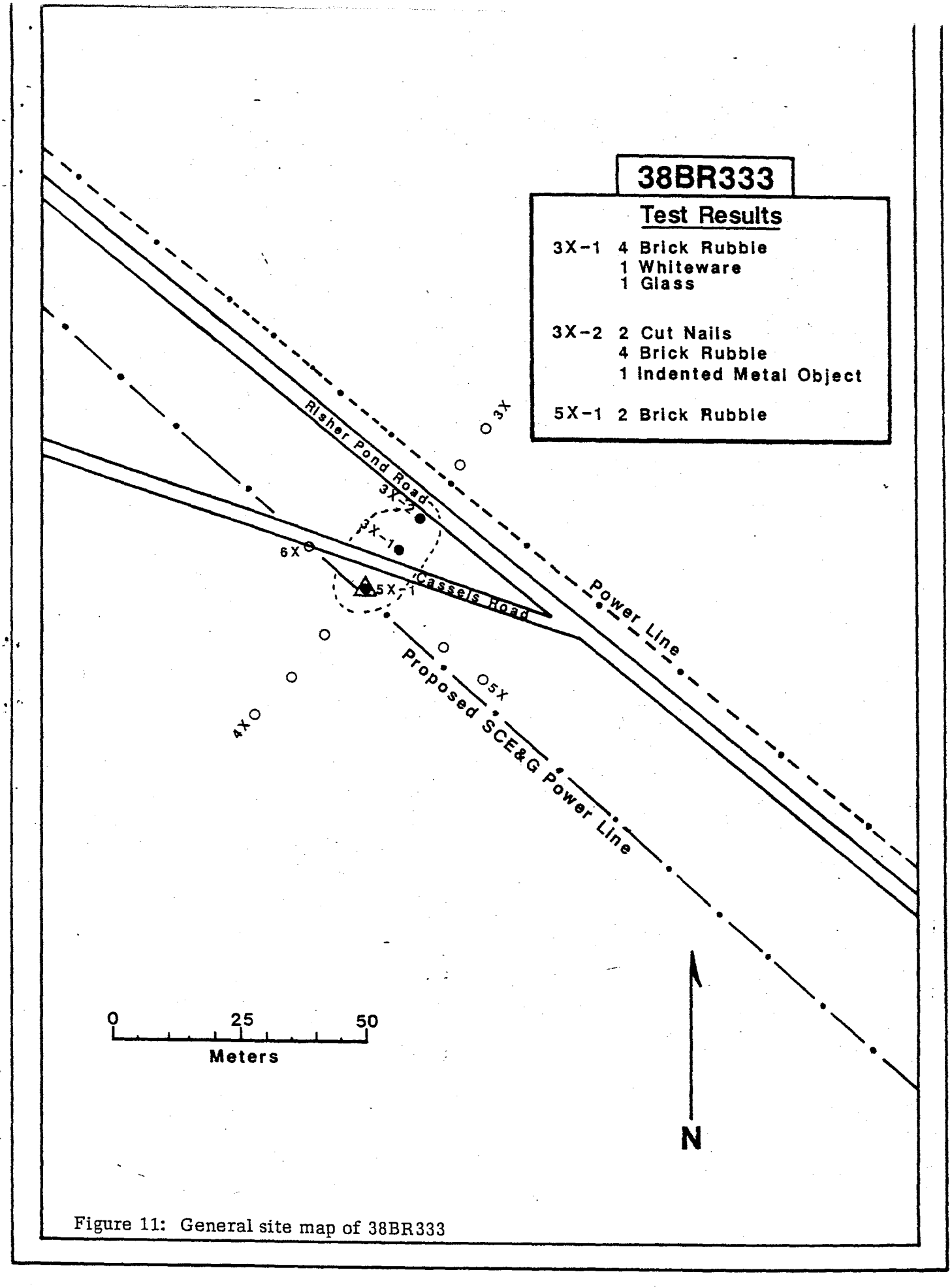


Figure 11: General site map of 38BR333

Figure 12: Site Photograph, 38BR333

In summation, this site lacks the necessary integrity for further work. The lack of sufficient artifactual material to adequately examine this site is not located within the sites boundaries. Construction of Risher Pond Road all but destroyed this site. The sites potential to add to the archaeological record has been met with all the information this site has to give.

TABLE 3

SITE LOCATION AND
CULTURE-HISTORICAL AFFILIATION

Site	Site Dimension (depth)	Landform/ Topographic Position	Elevation (feet)	Aspect	Slope %	Rank of Nearest Stream	Drainage System	Distance to Water (meters)	Soil Type	Culture - Historical Affiliation(s)
38BR35	140x300m/ 1.05m	Terrace	120	Northwest	2	4	Four Mile Creek and Tributaries	20	Troup Sand on terrace	Mississippian Late Woodland Middle Woodland Early Woodland Archaic
38BR104	100x100m/ .60m	Hill Slope	150	Southeast	7	3	Steel Creek and Tributaries	10	Lucy and Wagram	Middle Woodland Ceramic Late Archaic Early Archaic
38BR190	1x1 Surface	Hill Slope	245	Direct	0	1	Steel Creek and Tributaries	550	Troup Sand on terrace	Undiagnostic prehistoric lithic scatter
38BR205	7x10 Surface	Terrace	130	Southwest	4	1	Pen Branch and Tributaries	75	Troup Sand on terrace	Undiagnostic prehistoric lithic scatter
38BR333	20x30 .35m	Terrace	130	Direct	0	1	Four Mile Creek and Tributaries	300	Troup Sand on terrace	19th-20th Century-

TABLE 4

PREHISTORIC ARTIFACT ASSEMBLAGE INVENTORY

Site/ Provenience/ Level	Lithic Artifacts												
	Debitage	Fire-Cracked Rock	Hafted Bifaces	Other Bifaces	Unifaces	Utilized Flake	Other Tools	Coastal Plain Chert	Thermally Altered Chert	Quartz	Other	Total Lithic Artifacts
38BR35 -10	4				2	2	1	7	1		1	9
2X	72	3		1		2		32	43	3		78
3X	30	5	1 Otarre (TAC)					19	7	5	5	36
4X	25	3						14	11		3	28
5X	30	5		1				16	15	5		36
6X	50	1				1		22	29		1	52
7A	5								5			5
7B	57					3		4	53			57
7C	194	2				14	2	32	164	2	1	199
7D	1967	84	4Frags. (TAC)	5				470	1608		18	2076
7E	1445	109			1	15		495	964	81	35	1570
7F	728	18	1Frag (TAC) 1Frag (CPC)			3		267	465	15	5	751
7G	540	2					1	346	196	3		542
7H	310		1Frag. (CPC)					255	56	1		312
7I	74							62	12			74
7J	35							20	14	1		35
7K	12							10	2			12
TOTALS	5578	232	8	7	3	40	4	2071	3645	116	69	5872

TABLE 4

PREHISTORIC ARTIFACT ASSEMBLAGE INVENTORY
Ceramics

Site/ Provenience/ Level	Fiber Tempered Plain	Plain	Simple Stamped	Fine Check Stamped	Bold Check Stamped	Linear Check Stamped	Fine Cord Marked	Bold Cord Marked	Regular Punctate	Curvilinear Complicated Stamped	Eroded	Total Ceramics	TOTAL ARTIFACTS
38BR35- 1U												23	32
1X		4	17 (same vessel)			1	1				2	5	83
2X		2	1							1	2	9	45
3X		3	1	1			1						28
4X									1		3	4	40
5X													52
6X													5
7A											2	4	61
7B		1	1					1				1	200
7C													2076
7D													1570
7E													751
7F													542
7G													312
7H													74
7I													35
7J													12
7K													
TOTALS		10	20	1		1	2	1	1	1	9	46	5918

TABLE 4

PREHISTORIC ARTIFACT ASSEMBLAGE INVENTORY

Site/ Provenience/ Level	Lithic Artifacts												
	Debitage	Fire-Cracked Rock	Hafted Bifaces	Other Bifaces	Unifaces	Utilized Flake	Other Tools	Coastal Plain Chert	Thermally Altered Chert	Quartz	Other	Total Lithic Artifacts
38BR104-10	307		1Frag	2	1	7	1	284	34		1	319
20	331	2	2Frags	3		6		332	10	2		344
30			1Kirk (CPC)			1		2				2
40	34			1		8	2	20	22	3		45
50	14					1		8	7			15
60	10			3				6	7			13
7X	9							3	6			9
8B	3	1						1	2	1		4
8C	8					1		1	8			9
8D	16	1					1	7	9	1	1	18
8E	70	3				3		35	38	3		76
8F	25	1						3	22	1		26
TOTALS	827	8	4	9	1	27	4	702	165	11	2	880
38BR190-10	1							1				1
TOTALS	1							1				1
38BR205-10	6							6 ?				6
20	3							3				3
30	4			2			1	2	4	1		7
TOTALS	13			2			1	11	4	1		16
GRAND TOTALS	6419	240	12	18	4	67	9	2776	3814	128	71	6769

TABLE 4

PREHISTORIC ARTIFACT ASSEMBLAGE INVENTORY

Ceramics

Site/ Provenience/ Level	Fiber Tempered Plain	Plain	Simple Stamped	Fine Check Stamped	Bold Check Stamped	Linear Check Stamped	Fine Cord Marked	Bold Cord Marked	Regular Punctate	Curvilinear Complicated Stamped	Eroded	Total Ceramics	TOTAL ARTIFACTS
38BR104- 10													319
20													344
30													2
40													45
50						1						1	16
60	1				1							2	15
7X													9
8B													4
8C													9
8D													18
8E													76
8F													26
TOTALS	1				1	1						3	883
38BR190-10													1
TOTALS													1
38BR205- 10													6
20													3
30													7
TOTALS													16
GRAND TOTALS	1	10	20	1	1	2	2	1	1	1	9	49	6818

TABLE 5

38BR333

HISTORIC ARTIFACT INVENTORY

Provenience - Level

	1-0	2-0	3-X	4-X	5-X	TOTALS
Non-Ceramic Artifact Category						
Wine Bottle	1	0	0	0	0	1
Modern Glass	4	0	1	0	0	5
Cut Nails	0	0	2	0	0	2
Faunal	1	0	0	0	0	1
Brick/Mortar (grams)	5gr	17gr	10gr	0	63gr	95gr
Ceramic Categories						
Pearlware	3	0	0	0	0	3
Decorated Whiteware	4	0	1	0	0	5
Plain Whiteware	19	0	0	0	0	19
Alkaline Stoneware	2	0	0	0	0	2
Albany Stoneware	3	0	0	0	0	3
TOTALS (excludes brick/mortar)	37	0	4	0	0	41

CHAPTER VI

Archaeological Recommendations

The intensive archaeological survey and testing of the Vogtle SRP 230kv transmission line resulted in the examination of five archaeological sites (38BR35, 38BR104, 38BR190, 38BR205 and 38BR333). Each site was examined for the explicit purpose of establishing the presence of significant archaeological information in light of the eligibility criteria for nomination to the National Register of Historic Places. Further, information relative to the determination of potential effects was derived for each site location. This section summarizes the research results and presents recommended determinations of eligibility and considerations of effects with specific reference to the construction of the transmission line.

38BR190 and 38BR205

These prehistoric archaeological sites offered only minimal archaeological evidence which was obtained during the initial inventory of the Savannah River Plant (Hanson, Most and Anderson 1978). Data collected from these sites indicated very low frequency lithic distributions which are representative of brief human extractive forays in these upland settings as predicted by the human ecological model presented in the report. Intensive inspection of the sites through systematic shovel testing and thorough surface examination yielded no evidence of intact cultural deposits which would provide significant information concerning archaeological research problems. The value these sites have relative to human ecological and distributional problems has already been derived through the collection of the limited artifact assemblages. These data will be used in the evaluation of general models of human adaptation presently being prepared for the general Savannah River Plant archaeological synthesis. For these reasons, the authors recommend that 1) 38BR190 and 38BR205 are not eligible for nomination to the National Register of Historic Places because of their limited potential to provide additional information about past human occupations in the region, and 2) that no further consideration of the sites is warranted.

38BR333

This late 19th and early 20th century historic homesite was located between the right-of-ways of two unpaved roads which were constructed prior to the establishment of the Savannah River Plant in 1950. Intensive survey collection, mapping and subsurface shovel testing were used to document the extent, depth and integrity of the sites. As described in the previous section, this site was represented as a house structure on a 1940 map and examination of SRP maps dated 1950 indicates that the house was present at the time of federal acquisition of the land. According to Atomic Energy Commission land acquisition policy at the time the property was purchased structures were either moved or demolished in place. Evidence from 38BR333 suggests that the structure was demolished, creating an highly disturbed archaeological site.

Although the chronological position of the site falls within the 100 year criterion for the National Register of Historic Places, neither the overall artifact content nor the subsurface archaeological integrity of the deposits offer sufficient information for additonal investigations of historic research problems. It is therefore recommended that 1) the site is not eligible for nomination to the National Register of Historic Places, and 2) further work at the site would not yield significant information about the historic occupation in the region.

38BR35

This large multi-component, prehistoric archaeological site was intensively investigated as part of the Vogtle-SRP 230kv transmission line survey. As predicted in the human ecological model presented earlier, this site represents multiple episodes of prehistoric use during the Archaic and Woodland Periods as indicated by the rich pre-ceramic and ceramic strata investigated during site testing. Extending over 42,000 square meters of the terrace of Four Mile Creek to a depth of 1.05 meters, this site contains a wealth of significant information relevant to problems of chronological refinement, geoarchaeological sedimentation studies, Archaic organization of lithic technology and production, and changing site function during Archaic and Woodland Periods.

Based on the archaoelogical content of the site and the observed subsurface integrity of deposits, this site is considered to contain significant information which warrants its eligibility for nomination to the National Register of Historic Places. From the surface collection (provenience 1-0), the five shovel test lines (proveniences 2-X through 6-X), and the two by two meter test excavation unit, lithic debitage (n=5578), hafted bifaces (n=8), other bifaces (n=8), unifaces (n=3), utilzed flakes (n=40), and prehistoric ceramic sherds (n=46) represent a very dense human use of this location. The presence of these material in well defined stratigraphic sequence, as indicated by changes in the excavation illustrated in Table 4, provides the basis for investigation of the four specific research problems.

The proposed transmission line right-of-way bisects 38BR35 along a northwest to southeast line perpendicular to the terrace edge. The South Carolina Electric and Gas representative (Mr. Fred Cain) has stated that a tower structure must be placed within the limits of the site to provide adequate support for the line across Four Mile Creek. Thus, a potential effect will result from the excavation of this area for support tower construction. Forest clearing within the proposed right-of-way through 38BR35 can be accomplished without effect on the site's integrity if no heavy equipment is used to remove the logs and if logs are left in place rather than removed. This latter strategy of site conservation differs from the natural successional processes of the forest only in the mechanism of actual tree felling and should not be considered destructive to subsurface archaeological deposits, if sufficient measures are taken to prevent erosion of the site sediments.

Therefore, it is recommended that:

1) 38BR35 be determined eligible for nomination to the National Register of Historic Places because of its demonstrated potential to provide additional information relevant to prehistoric cultures in the region,
2) any adverse effects from right-of-way clearing can be avoided by careful cutting and subsequent erosion control within the site boundaries, and
3) the adverse effect posed by the placement of a support tower/structure within the site can be mitigated through data recovery/excavation within the tower construction and heavy equipment access areas.

38BR104

Situated on the west side of Steel Creek within the transmission line right-of-way, this prehistoric site was examined late in the survey as the result of a line change. Known from surface scattered lithic and ceramic material in the vicinity of the adjacent railroad line, this site was originally recorded and reported in 1977 (Hanson, Most and Anderson 1978). Six separate surface collections, a single shovel test line along the

right-of-way centerline, and a two by two meter test excavation unit constitute the data collection units from which the site is characterized. Based on the data presented in the site description 38BR104 is a 60 centimeter deep, stratified Archaic site overlain by sparse Woodland materials. Four research problems can be addressed using the site data: 1) Archaic Period chronology, 2) geoarchaeological sedimentation rates, 3) lithic technological organization and production during the Archaic Period, and 4) Archaic Period land use in the upland sandhills. Further, the site contains evidence of overall assemblage composition which is germane to studies of human ecology relative to the model presented herein.

Material derived from the surface and excavated contexts of the site include lithic debitage (n=827), hafted bifaces (n=4), other bifaces (n=9), a uniface (n=1), utilized flakes (n=27), other tools (n=4), prehistoric ceramics (n=3). No ceramics were recovered from excavated contexts. Although the contents of site are less dense than 38BR35 and other terrace sites (e.g. 38AK228, 38BR383), the stratified nature of the lithic assemblage suggests multiple Archaic Period occupations, probably of brief duration for the purpose of exploiting seasonally available food resources in the sandhills. No stratified Archaic Period sites are known in the SRP region which occur in the sandhill environment, thus making this location an important reference point in the study of early land use and human ecology. Data from this site can be directly compared with site assemblages from well documented base camps to characterize the techno-functional nature of this probable logistic/extractive site, a problem area not well understood because of the lack of excavated assemblage data from small Archaic sites in the Coastal Plain region. It is for these reasons that 38BR104 is considered significant and therefore is eligible for nomination to the National Register of Historic Places.

The proposed transmission line will cross the northern area of the site in the area where the two by two meter excavation unit (provenience 8), which documents the intact, stratified Archaic deposits, was placed. Possible effects on this archaeological resource which could result from the construction of the transmission line are direct disturbance in the immediate location of support towers and subsurface disturbance by heavy equipment used to harvest trees and clear the right-of-way. To avoid these effects and, therefore, prevent disturbance of the site, it is recommended that any structure/tower location be placed outside the boundaries of 38BR104 and that all timber harvesting and clearing on the site be accomplished using hand equipment. Further, it is recommended that the logs be left in place within the site boundaries to avoid ground disturbance, as was suggested for 38BR35. In the event that the site cannot be avoided by tower placement, then it is recommended that effects be mitigated through data recovery/excavation in areas of ground disturbance associated with heavy equipment and construction.

Therefore, it is recommended that:

1) 38BR104 be determined eligible for nomination to the National Register of Historic Places because of its demonstrated potential to provide new information relevant to prehistoric cultures in the region;
2) any adverse effects from right-of-way clearing can be avoided by careful cutting and subsequent erosion control within the site boundaries; and
3) the adverse effect posed by the possible placement of a support structure/tower within the site boundaries can be avoided by relocation outside the site limits, or through data recovery/excavation if relocation is not feasible.

In conclusion, the construction of the Vogtle-SRP 230kv transmission line through the Department of Energy's Savannah River Plant can minimize the effect on significant

archaeological resources through the implementation of a mitigation plan which combines limited disturbance clearing with avoidance and/or data recovery. It is through such conservation strategies that the cultural heritage of the region can be better maintained and understood.

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